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DATA DOCUMENTATION FOR THE 1981 SUMMER VEGETATION EXPERIMENT

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16. Abstract

The Mobile Agricultural Radar Sensor (MARS 10.2 GHz) was used to collect data from 31 fields in the floodplain of the Kansas River east of Lawrence, Kansas during the summer of 1981. Corn, soybeans, and wheat crops were observed from May 1 to November 11. Radar backscattering (σ^o) measurements were acquired at 10.2 GHz for VV and VH polarizations at 50° incidence angles for all fields and at 30°, 40°, 50°, 60°, and 70° for nine of the 31 fields. Target parameters describing the vegetation and soil characteristics, such as plant moisture, plant height, soil moisture, etc., were also measured. This report documents the methodology, radar backscatter data and associated ground-truth data obtained during this experiment.

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ABSTRACT

The Mobile Agricultural Radar Sensor (MARS 10.2 GHz) was used to collect data from 31 fields in the floodplain of the Kansas River east of Lawrence, Kansas during the summer of 1981. Corn, soybeans, and wheat crops were observed from May 1 to November 11, 1981. Radar backscattering (σ^{o}) measurements were acquired at 10.2 GHz for VV and VH polarizations at 50° incidence angles for all fields and at 30°, 40°, 50°, 60°, and 70° for nine of the 31 fields. Target parameters describing the vegetation and soil characteristics, such as plant moisture, plant height, soil moisture, etc., were also measured. This report documents the methodology, radar backscatter data and associated ground-truth data obtained during this experiment.

1.0 INTRODUCTION

The Mobile Agricultural Radar Sensor (MARS) was used to measure the radar backscattering coefficient (σ^o) for the 1981 vegetation experiments conducted by the Remote Sensing Laboratory (RSL). Ten fields each of wheat and corn, and 11 fields of soybeans were examined during their respective growing seasons from May to November. A crop calendar illustrating the time periods during which these fields were observed appears in Fig. 1.

Each of the 31 fields was observed three times per week with the 10.2-GHz system operating in both the like- and cross-polarization modes at a 50° incidence angle (θ). This data base is to be used to evaluate the ability of the radar system to differentiate crop type, since a large variability in σ^o can be expected from the ten different fields. Three of the ten fields of each crop type were selected for observations at 30°, 40°, 60°, and 70° incidence angles, as well as the previous 50° measurements. These observations were obtained once per week and the resulting data base is to be used to model the radar return from each crop type and relate it to the measured target parameters.

This report documents the radar and ground-truth data acquisition procedures used and presents the data collected during this experiment. Analysis and modeling of the acquired data are the subjects of forthcoming reports.

2.0 EXPERIMENT TEST SITE AND FIELD SELECTION

The test site for the 1981 vegetation experiment is located in the Kansas River floodplain north of Lawrence, Kansas. This area is intensively cultivated and provides a variety of crop and soil types suitable for this type of investigation.

Potential target fields were selected to minimize within-field variance in soil type, slope, drainage, weed infestations, and planting characteristics to provide as uniform a surface as possible. An attempt was made to maximize between-field variability by choosing the ten fields for each crop type from soils having a range of textures. Final target fields were then selected on the basis of accessibility and ease of data collection for the truck-mounted radar system. Figure 2 presents the experiment test site and field locations for the 1981 vegetation experiment.

3.0 MARS 10.2 GHz MEASUREMENTS

The MARS X-band scatterometer, described by Gabel et al. (1981), is a truck-mounted FM-CW radar operating at a center frequency of 10.2 GHz. This system has antennas configured in a side-looking mode that allows for drive-by data collection, which shortens fieldwork time considerably while increasing the statistical confidence in the data.

Statistical confidence is achieved by both frequency and spatial averaging to increase the number of independent samples incorporated into each σ° measurement. Gabel et al. (1981) presents the total number of independent samples obtained by the MARS system as a function of truck speed and incidence angle. During this experiment the total number of independent samples obtained for each σ° measurement was in the hundreds, resulting in a high degree of measurement precision. Both VV and VH polarization measurements can be obtained at incidence angles from 20° to 80°. Internal calibration via a delay line, and external calibration with a Luneberg lens are used to calibrate the instrument in terms of σ°, which is found using the radar equation. An average of the Lunberg lens measurements for the duration of the

experiment (5.9 dB) was used for calculating σ^o as the temporal variability was small (Figure 3).

Repeatability tests were performed on two corn fields (C1, C2) and a soybean field (S1) in the study area. Three different locations per field were measured four times each to generate 36 observations for comparison. The returned power measured by MARS was averaged for each location within a field and the four observations compared to this mean. Like-polarization measurements could be duplicated within ± .3 dB for 83% of the observations with the worst case being .6 dB less than the mean value. Cross-polarization measurements were within ± .4 dB of the mean value for 86% of the cases, with the worst measurement being 1 dB lower than the mean value for that particular location.

4.0 GROUND-TRUTH DATA ACQUISITION

On each day that radar measurements were collected for a given field, ground-truth data describing the soil and vegetation characteristics were also obtained. The field visitation was scheduled such that the ground-truth and radar observations were obtained within one hour of each other.

When each field was visited by the ground-truth crew, three observations were recorded for plant height and three samples collected for plant- and soil-moisture determination. Periodically, data on surface roughness, bulk density, soil-surface row structure, physiological growth stage, and crop damage were collected. One-time observations were also obtained for soil type, particle size, row direction, row spacing, and plant density. Weather data for rainfall, temperature, humidity, wind speed and direction were obtained from the Kansas University weather station and from four rain gauges distributed throughout the study area. Farm-operator reports were supplied by the farmers,

describing characteristics such as planting date, tillage, harvest date, yield, etc. Table 2 provides a summary of the ground-truth data collected during this experiment and Appendix I provides a more detailed account of the methodology used for the data collection.

5.0 DATA PROCESSING

The wheat fields were observed from early May until mid-July with an average of 22 data sets per field. By mid-May the corn and soybean fields were being observed as well, with the corn being harvested by mid-September and the soybeans by mid-November. There is an average of 34 data sets available for the corn fields and 37 data sets for the soybeans. Table 3 presents a field-by-field time history of data collection for the 31 fields investigated during this experiment.

The raw radar data are entered into the computer with the 50° data going into one file and the 30°-70° data into another file. These data are then edited prior to calculation of σ°_{VV} and σ°_{VH} values. Appendix II contains the σ° values for all the 50° data sets collected during this experiment. Similarly, the ground-truth measurements of plant height and percent soil and plant moistures are entered into the computer and edited before the calculation and averaging (three samples per data set) process takes place. Appendix II also contains these data. The model data (30°-70°), with its associated ground truth, is presented in Appendix III. Appendices IV - VIII contain weather data, periodic ground-truth measurements, farm-operator reports, the physiological growth-stage keys, and the particle-size classifications, respectively. The wet and dry biomass values from which the percentage moistures were calculated are located in Appendix IX.

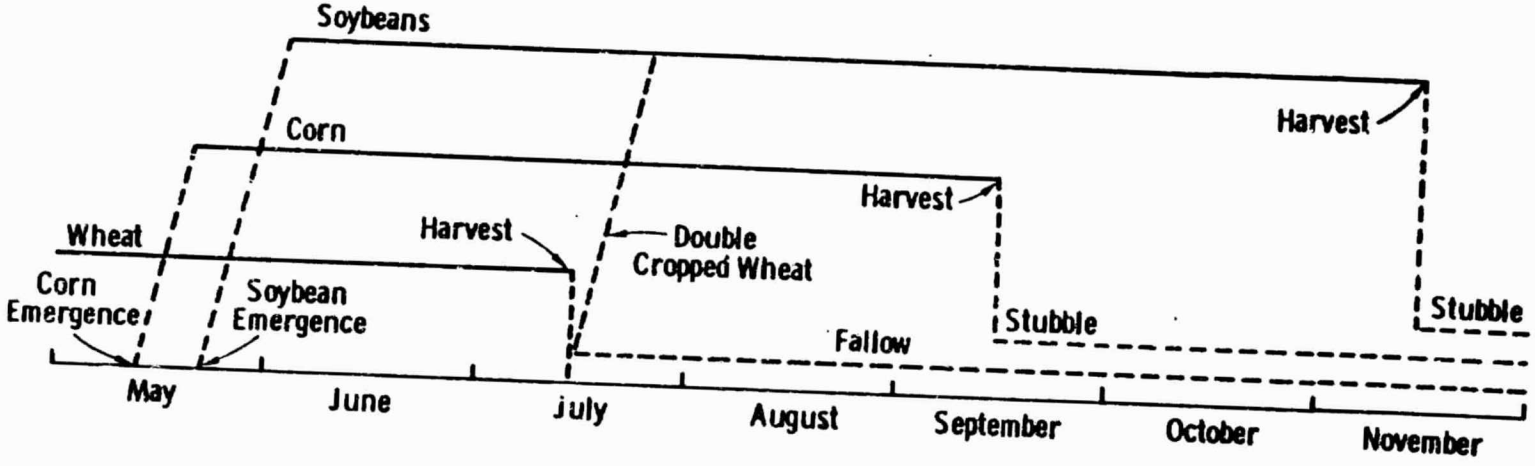

Figure 1. Crop Calendar Illustrating the Time Periods During the 1981 Vegetation Experiment that the Wheat, Corn, and Soybean Fields were Observed.

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Figure. Location of the Target Fields in the Study Area.
*Indicates a Wheat Field Double Cropped with Soybeans
+rain gauges

Figure 3 Time History of Lunberg Lens Measurements for the 1981 Summer Vegetation Experiment

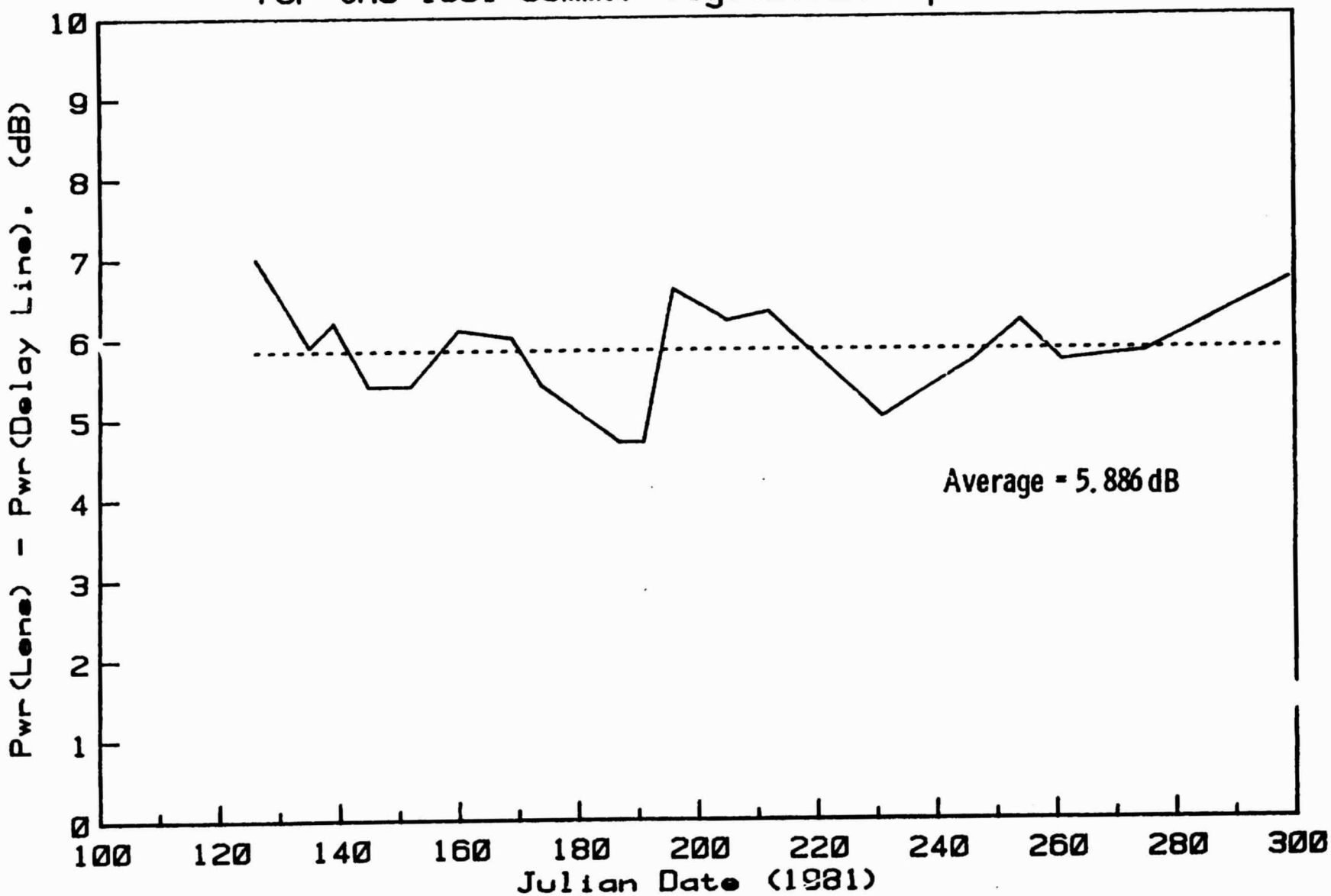

TABLE 1

MARS System Parameters

Type		FM-CW
Modulation		Triangular
Frequency: f_o		10.2 GHz
RF Bandwidth: Δf		420 MHz
Transmitter Power		60 mW
IF Frequency: f_{IF}		22 KHz
Antennas:		
Height above ground		9.3 m
Transmit antenna diameter		30 cm
Cross-polarization antenna		standard gain horn
Transmit feed		dipole
Beamwidths of product patterns $(G_T(\theta,\phi) \cdot G_R(\theta,\phi))$		
	VV Elevation :	3.96°
	Azimuth :	4.31°
	VH Elevation :	5.44°
	Azimuth :	5.14°
Look-Angle Range:		θ 20° - 80° from vertical
Dynamic Range:		50 dB

TABLE 2

Ground-Truth Variables Measured for Summer 1981
Vegetation Experiments

TYPE	VARIABLE	MEASUREMENT PERIODICITY
Crop	Height	Every Observation Day (EOD)
	Plant Moisture	EOD
	Row Direction	Once
	Row Spacing	Once
	Density	Once
	Physiological Growth Stage	Periodic
Soil	Surface Moisture (0-5 cm)	EOD
	Surface Roughness	Periodic
	Bulk Density	Periodic
	Type	Once
	Particle Size	Once
	Row Structure	Periodic
Other	Rainfall	Periodic
	Humidity - Temperature	Daily
	Wind Speed and Direction	Daily
	Infestations/Damage	Periodic
	Operator Reports	Once
	Start Time	EOD

TABLE 3

Time History of Data Collection for the Wheat, Corn and Soybean Fields

Field	Start Date	Number of Data Sets	Approximate Harvest Date	Number of Stubble Data Sets	Stop Date
W1	05/01	22	06/22	4	07/14
W2	05/01	18	06/22	4	07/14
W3	05/01	23	06/29	2	07/14
W4	05/01	17	07/15	1	07/15
W4M*	05/06	6	07/15	0	06/17
W5	05/01	17	07/15	1	07/15
W5M	05/06	5	07/15	0	06/17
W6	05/01	23	06/29	2	07/15
W7	05/08	18	06/24	2	07/15
W7M	05/06	6	06/24	0	06/17
W8	05/01	24	07/15	1	07/15
W9	05/01	21	06/19	3	07/15
W10	05/01	23	06/29	2	07/15
C1	05/19	37	09/13	1	09/13
C2	05/19	27	08/12	2	08/13
C3	05/19	33	09/06	1	09/06
C4	05/19	27	?	0	08/13
C5	05/19	33	09/03	1	09/03
C6	05/19	36	?	0	09/15
C6M	05/22	11	?	0	09/15
C7	05/20	35	09/15	2	09/16
C7M	05/22	10	09/15	0	08/10
C8	05/20	26	08/26	1	08/26
C9	05/20	32	09/10	2	09/13
C10	05/20	30	?	0	09/16
C10M	05/23	10	?	0	09/15
S1	05/21	48	10/21	2	10/23
S2	05/21	45	?	0	10/23
S3	05/21	43	?	0	10/07
S3M	07/22	9	?	0	10/07
S4	06/03	38	?	1	10/07
S5	05/21	38	10/02	1	10/02
S6	07/20	28	10/20	1	10/21
S7	07/22	7	?	0	08/07
S8	07/22	20	11/11	1	11/11
S8M	08/11	5	11/11	0	10/07
S9	07/22	29	10/23	1	10/23
S10	07/23	27	11/06	0	10/28
S11	08/03	23	10/21	2	10/23
S11M	07/22	8	10/20	0	10/07

*M = Model Field

APPENDIX I: Ground-Truth Sampling Procedures

The following briefly describes the procedures used for collecting ground-truth data.

Type	Variable	Methodology
Crop	Height	• Recorded to nearest cm with meter stick.
	Plant Moisture	• Standard gravimetric method (percent wet weight).
	Row Direction	• Parallel or perpendicular to radar look-direction.
	Row Spacing	• Measured 5 times per field, then averaged.
	Density	• Measured 5 times per field then averaged; measured per linear foot for wheat, per meter for soybeans, and per five meters for corn.
	Physiological Growth Stage	• Determined from charts in the AgRISTARS Enumerator's Manual.
Soil	Surface Moisture (0-5 cm)	• Standard gravimetric method (percent dry weight).
	Surface Roughness	• Standard "roughness board" photographs.
	Bulk Density	• Standard method for 0-5- and 0-7-cm depths, 2 cores per field.
	Type	• From Douglas County Soils Map.
	Particle Size	• By hydrometer method.
	Row Structure	• Peak-to-peak and peak-to-trough measurements to nearest .1 cm with meter stick.
Other	Rainfall	• KU Weather Service data; four gauges in study area.
	Humidity-Temperature	• KU Weather Service data.
	Wind Speed/Direction	• KU Weather Service data.
	Infestations/Damage	• Recorded as slight, moderate, or heavy for insects, wind, water, and weeds.
	Operator Reports	• Mail survey.

APPENDIX II: Radar Data and Associated Ground Truth for 50° Observations of the 1981 Vegetation Experiment

Plant-Part Codes	
Code	Description
1	Leaves
2	Stalk
3	Ear (or cob)
4	Tassle or head
5	Whole plant
6	Combined leaves and stalk
7	Combined stalk and ear
8	Combined stalk and tassle (head)
9	Combined ear and tassle

Wheat Field # 1 Radar Data: $\theta = 50^{\circ}$, f = 10.2 GHz

Calendar Date	Julian Date	σ°_{vv} (dB)	σ°_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/01/81	121	-16.25	-22.11	3.0	5	60.0	69.2			
5/06/81	126	-15.58	-20.73	6.1	-	--	--			
5/08/81	128	-15.36	-20.21	4.5	5	62.0	81.0			
5/11/81	131	-14.03	-17.99	12.9	6	53.6	68.8	4	59.0	63.3
5/15/81	135	-13.62	-16.98	13.9	6	51.9	74.0	4	60.7	61.3
5/19/81	139	-14.26	-18.61	19.4	6	48.9	78.0	4	51.7	64.7
5/20/81	140	-13.23	-18.49	20.5	6	50.7	75.7	4	25.9	61.7
5/22/81	142	-12.67	-17.92	16.0	6	54.0	71.7	4	64.1	56.7
5/27/81	147	-13.44	-19.30	11.1	6	56.9	74.3	4	59.5	56.3
5/29/81	149	-13.37	-17.52	21.7	6	58.2	80.5	4	57.3	56.0
6/01/81	152	-13.20	-17.06	15.8	6	53.0	68.7	4	50.7	51.3
6/03/81	154	-14.60	-18.36	22.8	6	48.7	73.0	4	48.4	54.3
6/04/81	155	-13.80	-17.76	24.9	6	58.0	70.0	4	48.3	49.3
6/08/81	159	-10.60	-16.06	21.1	6	33.5	72.3	4	29.8	46.8
6/10/81	161	-11.34	-16.19	18.3	6	44.1	70.0	4	22.7	45.7
6/16/81	167	-11.00	-12.56	19.1	6	30.3	64.7	4	12.4	48.3
6/17/81	168	-10.72	-16.38	20.1	6	28.0	70.7	4	10.1	43.7
6/18/81	169	-9.38	-16.23	19.9	6	24.6	71.0	4	7.4	49.0
6/22/81	173	-8.99	-13.84	22.2	6	27.7	29.3			
6/26/81	177	-8.35	-15.60	17.5	-	--	--			
6/29/81	180	-10.91	-18.16	14.6	-	--	--			
7/14/81	195	-7.77	-17.32	10.7	-	--	16.0			

Wheat Field # 2 Radar Data: $\theta = 50^{\circ}$, f = 10.2 GHz

Calendar Date	Julian Date	σ°_{vv} (dB)	σ°_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/01/81	121	-10.74	-19.89	4.1	5	73.0	65.2			
5/06/81	126	-13.95	-21.01	6.3	5	67.5	81.0			
5/08/81	128	-18.73	-22.89	4.4	5	68.6	78.0			
5/11/81	131	-16.84	-19.69	10.6	6	57.8	83.3	4	55.8	64.3
5/15/81	135	-16.14	-18.29	11.8	6	59.8	82.3	4	61.3	62.0
5/20/81	140	-18.15	-19.81	16.9	6	53.6	90.7	4	64.4	62.0
5/22/81	142	-19.57	-18.92	12.8	6	58.7	82.3	4	64.0	51.0
5/27/81	147	-15.37	-18.92	14.8	6	56.8	70.3	4	56.9	53.8
6/01/81	152	-16.40	-20.05	15.9	6	57.5	82.3	4	54.0	56.7
6/08/81	159	-16.50	-20.76	16.2	6	54.4	82.7	4	44.7	54.7
6/10/81	161	-16.97	-21.92	16.5	6	52.4	83.7	4	33.7	58.7
6/16/81	167	-5.53	-11.59	--	6	38.1	75.0	4	15.6	46.0
6/17/81	168	-7.50	-14.66	15.1	6	41.2	68.3	4	11.3	46.7
6/18/81	169	-7.87	-12.02	18.9	6	40.3	77.7	4	9.3	57.3
6/22/81	173	-10.74	-13.59	20.2	6	28.7	40.2			
6/26/81	177	-9.10	-14.05	18.7	6	14.6	32.7			
6/29/81	180	-7.74	-13.90	20.2	6	4.8	34.0			
7/14/81	195	-10.84	-18.10	11.0	5	8.6	36.0			

Wheat Field # 3 Radar Data: $\theta = 50^{\circ}$, f = 10.2 GHz

Calendar Date	Julian Date	σ°_{vv} (dB)	σ°_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/01/81	121	-11.13	-17.48	14.8	5	78.8	77.4			
5/06/81	126	-11.00	-18.55	16.6	5	77.0	78.3			
5/08/81	128	-10.26	-18.72	20.9	5	78.0	81.3			
5/11/81	131	-10.90	-19.15	28.3	6	75.7	91.5	4	70.7	84.3
5/15/81	135	-13.90	-18.36	25.5	6	69.1	100.8	4	65.1	81.5
5/19/81	139	-16.24	-21.09	30.0	6	70.4	106.7	4	67.6	81.3
5/20/81	140	-16.66	-20.61	30.6	6	63.8	105.0	4	59.2	90.3
5/22/81	142	-15.43	-19.39	28.5	6	71.6	105.7	4	67.0	73.7
5/27/81	147	-15.54	-18.89	35.7	6	69.1	99.2	4	67.3	68.3
5/29/81	149	-14.57	-18.82	36.7	6	69.2	86.3	4	62.1	66.0
6/01/81	152	-16.60	-20.46	30.0	6	62.0	96.0	4	63.9	71.0
6/03/81	154	-7.46	-17.51	40.8	6	64.5	102.3	4	57.0	67.0
6/04/81	155	-8.77	-13.12	44.5	6	68.4	97.3	4	54.2	68.3
6/08/81	159	-16.30	-21.56	35.8	6	60.3	99.7	4	50.1	70.0
6/10/81	161	-13.56	-14.72	31.0	6	60.5	99.0	4	44.7	68.0
6/16/81	167	-11.37	-13.32	35.3	6	55.7	95.0	4	33.2	65.3
6/17/81	168	-13.81	-15.86	30.4	6	48.3	85.0	4	17.4	44.0
6/18/81	169	-11.98	-14.33	29.4	6	42.4	79.7	4	13.8	45.3
6/22/81	173	-8.40	-13.65	40.0	6	61.7	79.0	4	19.5	53.3
6/24/81	175	-10.01	-15.96	38.3	6	31.0	84.0	4	7.1	62.3
6/26/81	177	-8.26	-13.31	33.8	6	36.4	77.0	4	6.2	47.5
6/29/81	180	-5.06	-11.21	32.2	6	25.9	22.3			
7/14/81	195	-8.09	-17.55	20.6	5	14.8	24.7			

Wheat Field # 4 Radar Data: $\theta = 50^{\circ}$, f = 10.2 GHz

Calendar Date	Julian Date	σ°_{vv} (dB)	σ°_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/01/81	121	-11.12	-19.68	18.7	5	71.5	75.0			
5/06/81	126	-14.54	-21.49	23.8	5	77.6	93.7			
5/08/81	128	-16.26	-21.82	21.6	5	76.9	93.3			
5/11/81	131	-16.09	-20.45	25.4	6	66.6	99.3	4	69.1	92.0
5/15/81	135	-17.61	-20.86	29.3	6	72.6	102.0	4	62.2	86.0
5/20/81	140	-17.70	-20.85	37.4	6	65.4	102.0	4	60.3	80.0
5/22/81	142	-17.45	-21.01	34.9	6	70.7	106.7	4	68.2	75.7
5/27/81	147	-16.19	-20.75	34.8	6	67.4	99.7	4	64.3	73.3
6/01/81	152	-13.12	-17.38	33.1	6	63.9	102.7	4	58.0	76.7
6/08/81	159	-17.26	-21.01	40.1	6	59.0	101.0	4	45.1	75.3
6/10/81	161	-14.20	-17.56	38.7	6	60.9	101.0	4	51.5	73.3
6/17/81	168	-11.40	-16.75	38.1	6	54.1	89.0	4	20.5	59.7
6/18/81	169	-12.57	-13.52	37.7	6	49.6	92.0	4	13.3	66.7
6/25/81	176	-10.32	-16.88	--	-	--	--			
6/29/81	180	-9.19	-12.05	49.0	6	14.3	57.3	4	3.2	45.0
7/02/81	183	-8.59	-11.34	50.0	6	15.9	85.0	4	7.5	150.0
7/15/81	196	-8.03	-16.58	36.9	5	4.3	23.7			

Wheat Field # 5 Radar Data: $\theta = 50^{\circ}$, f = 10.2 GHz

Calendar Date	Julian Date	σ°_{vv} (dB)	σ°_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/01/81	121	-11.47	-24.02	13.6	5	70.8	84.2			
5/06/81	126	-12.45	-21.51	21.7	5	76.1	84.2			
5/08/81	128	-12.99	-20.54	19.6	5	76.9	100.2			
5/11/81	131	-12.49	-20.54	26.4	6	73.4	100.0	4	73.7	92.0
5/15/81	135	-13.84	-20.29	30.1	6	72.6	99.3	4	71.8	57.7
5/28/81	148	-16.00	-20.26	28.8	6	72.3	97.7	4	70.5	87.0
5/29/81	149	-14.27	-19.93	25.8	6	71.6	103.5	4	68.8	85.0
6/01/81	152	-15.62	-20.97	27.7	6	64.1	99.0	4	61.0	77.0
6/08/81	159	-15.70	-19.85	31.9	6	63.4	92.3	4	50.8	69.1
6/10/81	161	-18.47	-20.92	29.3	6	63.5	98.0	4	47.2	63.7
6/16/81	167	-12.90	-13.66	32.5	6	54.7	94.7	4	36.2	60.7
6/17/81	168	-14.97	-19.92	32.6	6	47.4	88.0	4	30.1	54.7
6/18/81	169	-13.73	-16.19	33.6	6	53.9	94.7	4	31.3	71.7
6/24/81	175	-10.62	-13.97	46.7	6	34.2	72.7	4	6.4	55.0
6/29/81	180	-6.95	-13.00	45.8	6	30.0	60.3	4	2.4	49.3
7/02/81	183	-7.73	-12.49	47.8	6	12.6	54.3	4	4.9	50.3
7/15/81	196	-2.74	-14.29	28.8	-	--	--			

Wheat Field # 6 Radar Data: $\theta = 50^{\circ}$, f = 10.2 GHz

Calendar Date	Julian Date	σ°_{vv} (dB)	σ°_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/01/81	121	-11.63	-18.38	4.6	5	63.2	64.0			
5/06/81	126	-13.06	-19.72	11.6	5	67.8	94.7			
5/08/81	128	-14.01	-19.86	8.0	5	66.7	69.7			
5/11/81	131	-14.25	-18.30	19.1	6	55.7	89.0	4	62.6	81.0
5/15/81	135	-15.00	-15.76	24.8	6	64.3	97.0	4	59.5	73.8
5/20/81	140	-15.27	-18.22	26.6	6	53.5	91.3	4	67.3	66.8
5/22/81	142	-14.07	-16.82	21.1	6	59.4	83.0	4	63.7	64.0
5/27/81	147	-15.16	-18.11	26.2	6	59.1	78.8	4	57.5	61.3
5/29/81	149	-14.99	-18.84	28.6	6	63.2	85.5	4	56.3	57.3
6/01/81	152	-14.79	-19.55	18.3	6	56.8	82.7	4	51.1	71.3
6/03/81	154	-14.70	-18.35	34.2	6	55.7	80.8	4	47.6	57.7
6/05/81	156	-15.00	-19.25	29.9	6	56.4	83.3	4	47.7	66.0
6/08/81	159	-10.97	-15.02	28.6	6	51.6	80.0	4	34.4	51.7
6/10/81	161	-15.77	-19.72	28.2	6	55.6	78.8	4	28.7	56.5
6/12/81	163	-15.57	-15.72	32.0	6	55.6	80.7	4	33.8	59.0
6/15/81	166	-10.86	-15.01	34.5	6	60.9	79.7	4	25.9	57.7
6/17/81	168	-13.07	-14.82	31.1	6	49.0	79.7	4	12.3	52.0
6/19/81	170	-9.47	-14.42	30.2	6	31.0	75.7	4	9.8	60.0
6/22/81	173	-8.10	-14.65	34.2	6	36.6	81.2	4	16.0	61.3
6/24/81	175	-8.64	-15.10	28.9	6	22.5	75.3	4	11.9	69.2
6/26/81	177	-8.41	-13.46	30.4	6	23.0	65.3	4	5.1	60.0
6/29/81	180	-8.18	-14.34	29.5	6	6.7	26.0			
7/15/81	196	-8.59	-18.15	26.8	5	3.5	29.3			

Wheat Field # 7 Radar Data: $\theta = 50^{\circ}$, f = 10.2 GHz

Calendar Date	Julian Date	σ°_{vv} (dB)	σ°_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/06/81	126	-20.85	-24.81	16.4	5	61.6	81.8			
5/08/81	128	-16.84	-21.99	12.3	5	67.4	116.3			
5/11/81	131	-16.70	-21.06	22.6	6	58.3	103.0	4	63.8	91.0
5/15/81	135	-17.85	-18.71	26.1	6	59.7	90.3	4	60.2	74.2
5/20/81	140	-14.77	-19.02	28.3	6	54.6	96.3	4	63.3	86.0
5/22/81	142	-13.44	-18.79	27.0	6	58.3	98.7	4	59.4	75.0
5/27/81	147	-9.47	-13.83	26.3	6	57.6	95.8	4	58.7	72.0
5/29/81	149	-9.93	-12.59	15.9	6	58.0	94.7	4	55.1	66.7
6/01/81	152	-8.09	-13.25	19.7	6	55.7	90.3	4	47.6	66.2
6/05/81	156	-8.40	-12.76	30.2	6	53.7	96.3	4	42.1	68.0
6/08/81	159	-5.94	-8.29	28.6	6	49.2	87.3	4	39.4	63.0
6/10/81	161	-9.32	-11.17	28.6	6	50.8	95.7	4	28.6	71.3
6/12/81	163	-6.80	-8.56	32.3	6	51.9	90.3	4	28.6	53.0
6/16/81	167	-6.87	-7.92	29.5	6	39.4	78.3	4	12.1	49.7
6/17/81	168	-7.53	-10.49	30.9	6	44.9	77.7	4	9.4	44.0
6/19/81	170	-5.98	-9.13	28.7	6	33.7	73.3	4	9.7	48.7
6/26/81	177	-5.94	-11.09	29.2	6	27.9	22.0			
7/15/81	196	-6.86	-16.41	17.0	5	20.6	18.7			

Wheat Field # 8 Radar Data: $\theta = 50^{\circ}$, f = 10.2 GHz

Calendar Date	Julian Date	σ°_{vv} (dB)	σ°_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/01/81	121	-14.70	-19.86	9.3	5	65.1	80.3			
5/06/81	126	-17.70	-20.76	15.5	5	73.9	114.7			
5/08/81	128	-15.37	-19.42	14.5	5	74.6	85.3			
5/11/81	131	-14.57	-18.12	18.3	6	59.9	110.0	4	69.4	90.0
5/15/81	135	-15.55	-19.20	21.9	6	60.6	101.3	4	57.1	78.0
5/20/81	140	-15.37	-18.72	23.6	6	63.5	113.5	4	67.0	76.7
5/22/81	142	-15.10	-19.15	18.0	6	60.4	104.0	4	59.4	74.0
5/28/81	148	-15.34	-20.09	21.7	6	62.6	101.7	4	61.6	70.3
5/29/81	149	-15.63	-20.09	23.1	6	50.7	81.7	4	56.9	56.3
6/01/81	152	-16.57	-21.02	19.0	6	58.2	102.0	4	52.9	75.3
6/03/81	154	-14.17	-18.82	25.8	6	55.0	90.3	4	47.1	52.3
6/05/81	156	-16.03	-19.39	26.3	6	58.0	104.5	4	46.4	68.0
6/08/81	159	-14.57	-17.12	23.7	6	54.2	103.3	4	40.6	68.0
6/10/81	161	-16.19	-15.24	24.4	6	50.1	83.7	4	28.3	63.5
6/12/81	163	-10.70	-15.55	23.6	6	52.8	93.7	4	33.5	63.8
6/15/81	166	-11.83	-16.69	29.3	6	50.9	101.0	4	27.3	74.3
6/17/81	168	-8.30	-14.56	23.3	6	43.9	78.0	4	13.4	52.7
6/19/81	170	-5.06	-10.52	22.6	6	29.9	82.0	4	9.4	64.0
6/22/81	173	-6.45	-14.21	28.2	6	43.0	78.0	4	18.6	57.7
6/24/81	175	-7.04	-13.00	26.1	6	17.6	60.3	4	6.1	31.0
6/26/81	177	-6.94	-13.49	25.3	6	9.3	79.7	4	5.4	60.7
6/29/81	180	-8.37	-13.62	25.1	6	8.3	80.0	4	6.9	44.7
7/02/81	183	-6.61	-11.76	25.9	6	4.5	65.3	4	4.3	57.0
7/15/81	196	-5.03	-12.39	16.5	5	12.4	23.3			

Wheat Field # 9 Radar Data: $\theta = 50^{\circ}$, f = 10.2 GHz

Calendar Date	Julian Date	σ°_{vv} (dB)	σ°_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/01/81	121	-18.30	-23.85	3.5	5	60.0	62.0			
5/06/81	126	-18.34	-21.59	9.1	5	63.3	57.7			
5/08/81	128	-15.63	-20.48	7.5	5	65.9	83.3			
5/11/81	131	-13.69	-17.14	10.8	6	48.6	81.0	4	61.7	72.0
5/15/81	135	-11.31	-15.26	14.1	6	63.1	82.7	4	62.8	63.8
5/19/81	139	-11.16	-16.12	16.2	6	53.9	75.3	4	59.2	64.7
5/20/81	140	-11.20	-16.15	15.9	6	54.8	69.3	4	59.8	60.0
5/22/81	142	-12.20	-17.25	15.2	6	54.5	66.7	4	63.0	46.0
5/28/81	148	-13.34	-17.99	13.4	6	59.4	80.7	4	58.9	60.0
5/29/81	149	-14.03	-17.39	13.4	6	47.4	77.0	4	61.6	51.3
6/01/81	152	-16.10	-19.75	12.1	6	56.5	74.7	4	51.8	56.3
6/03/81	154	-14.01	-16.87	18.3	6	58.4	67.3	4	48.4	50.3
6/05/81	156	-11.89	-15.44	19.1	6	57.3	70.3	4	45.2	49.7
6/08/81	159	-10.00	-15.25	15.3	6	59.0	71.8	4	33.0	56.3
6/10/81	161	-11.47	-15.53	12.8	6	55.6	73.0	4	23.7	50.3
6/12/81	163	-8.34	-12.69	17.7	6	54.4	72.0	4	26.9	53.7
6/15/81	166	-8.48	-13.13	20.3	6	50.7	71.3	4	28.2	51.3
6/17/81	168	-6.27	-15.13	16.5	6	34.7	72.7	4	11.4	44.0
6/19/81	170	-4.37	-12.72	16.2	6	26.0	30.2			
6/22/81	173	-5.58	-15.93	19.2	6	25.9	28.7			
7/15/81	196	-10.13	-17.59	3.3	5	12.3	26.7			

Wheat Field # 10 Radar Data: $\theta = 50^{\circ}$, f = 10.2 GHz

Calendar Date	Julian Date	σ°_{vv} (dB)	σ°_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/01/81	121	-10.32	-18.38	6.9	5	56.9	29.0			
5/06/81	126	-15.10	-20.25	18.0	5	71.5	48.7			
5/08/81	128	-13.46	-19.31	11.8	5	68.7	42.7			
5/11/81	131	-13.74	-18.70	13.3	5	72.2	39.3			
5/15/81	135	-13.99	-18.84	21.8	5	62.7	66.8			
5/20/81	140	-9.57	-18.02	23.4	5	72.6	61.3			
5/22/81	142	-16.63	-20.49	19.1	5	72.0	60.3			
5/28/81	148	-16.07	-19.32	16.7	6	74.6	66.2	4	75.3	61.8
5/29/81	149	-16.01	-20.27	25.3	6	65.4	93.7	4	64.7	64.3
6/01/81	152	-15.84	-18.99	17.9	6	65.2	93.3	4	65.1	65.3
6/03/81	154	-15.26	-17.92	19.0	6	63.2	95.3	4	64.0	63.7
6/05/81	156	-17.20	-21.25	15.7	6	65.9	82.0	4	70.0	50.0
6/08/81	159	-16.56	-17.82	17.1	6	55.1	94.0	4	55.0	58.3
6/10/81	161	-17.65	-13.61	9.7	6	56.6	83.7	4	53.5	55.3
6/12/81	163	-16.76	-14.42	19.3	6	58.8	88.7	4	56.2	51.3
6/15/81	166	-10.30	-11.55	21.9	6	57.4	88.7	4	57.6	58.0
6/17/81	168	-10.66	-14.61	21.0	6	44.3	88.7	4	34.4	58.0
6/19/81	170	-9.06	-12.42	21.0	6	41.3	76.0	4	40.9	47.3
6/22/81	173	-5.62	-10.77	30.9	6	16.4	54.7	4	16.2	42.3
6/24/81	175	-6.12	-12.57	21.5	6	13.7	77.7	4	26.3	52.3
6/26/81	177	-6.63	-10.19	19.6	6	17.5	83.0	4	5.3	53.7
6/29/81	180	-5.12	-12.48	17.7	6	36.3	27.3			
7/15/81	196	-7.78	-15.13	--	5	31.2	19.8			

Corn Field # 1 Radar Data: $\theta = 50^{\circ}$, f = 10.2 GHz

Calendar Date	Julian Date	σ°_{vv} (dB)	σ°_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/19/81	139	-10.24	-19.19	23.3	5	76.1	26.7						
5/21/81	141	-10.24	-17.89	20.6	5	81.7	38.3						
5/26/81	146	-7.47	-14.72	17.4	5	88.1	49.7						
5/27/81	147	-10.17	-17.62	10.7	5	86.8	53.7						
5/29/81	149	-7.04	-13.99	21.0	5	89.0	58.5						
6/03/81	154	-5.56	-13.11	25.6	5	90.2	73.7						
6/04/81	155	-5.00	-12.15	24.2	5	90.5	81.0						
6/05/81	156	-5.73	-13.89	20.9	5	89.3	93.3						
6/09/81	160	-5.89	-13.05	19.1	5	90.2	125.7						
6/12/81	163	-6.79	-12.45	22.9	5	91.5	152.3						
6/16/81	167	-7.45	-12.51	26.0	5	92.8	170.3						
6/18/81	169	-7.51	-16.06	21.7	5	90.4	186.7						
6/19/81	170	-7.38	-15.43	23.7	5	92.4	185.0						
6/24/81	175	-8.93	-13.38	22.8	6	87.8	205.0	4	76.1	--			
6/25/81	176	-7.44	-13.69	21.2	1	75.9	226.0	2	86.7	--	9	85.1	225.0
7/02/81	183	-7.04	-12.40	25.7	1	78.8	234.0	8	80.2	258.3	3	89.9	--
7/13/81	194	-7.49	-14.74	10.9	1	73.9	232.7	3	77.7	--	8	80.0	265.7
7/15/81	196	-7.62	-14.08	11.0	1	73.4	236.7	3	75.7	--	8	79.9	247.3
7/17/81	198	-8.17	-14.43	6.8	1	74.7	242.3	3	76.1	--	8	79.3	269.0
7/20/81	201	-6.94	-12.90	21.7	1	73.0	232.7	3	69.2	--	8	80.5	260.0
7/23/81	204	-8.93	-16.68	18.8	1	76.2	236.7	3	91.9	--	8	83.6	262.3
7/28/81	209	-8.56	-15.72	16.5	1	74.0	229.0	3	65.9	--	8	78.2	256.7
7/29/81	210	-8.41	-14.56	23.5	1	74.3	246.7	3	66.5	--	8	82.2	270.0
7/30/81	211	-8.06	-14.72	22.8	1	71.1	230.7	3	73.3	--	8	82.7	254.0
8/04/81	216	-8.41	-13.06	36.1	1	72.3	201.3	3	51.0	--	8	82.3	250.3
8/06/81	218	-8.97	-16.62	26.5	1	69.5	236.7	3	69.1	--	8	80.6	261.3
8/10/81	222	-8.77	-15.83	20.4	1	63.5	225.3	3	32.8	--	8	79.9	264.0
8/12/81	224	-9.14	-15.99	17.0	1	50.3	222.7	3	28.2	--	8	80.6	230.7
8/13/81	225	-10.07	-16.93	19.4	1	59.4	237.0	3	36.1	--	8	80.8	256.0
8/24/81	236	-12.44	-17.90	10.4	1	27.3	120.3	3	27.1	--	8	70.6	269.0
8/28/81	240	-5.02	-12.97	22.9	1	11.3	223.0	3	22.1	--	8	73.0	236.0
8/30/81	242	-7.46	-13.91	19.7	1	--	217.0	3	23.6	--	8	72.8	233.0
9/01/81	244	-4.78	-12.53	26.7	1	2.8	--	3	94.2	--	8	70.6	244.0
9/03/81	246	-4.76	-12.81	22.5	1	2.8	245.0	3	39.2	--	8	65.4	255.5
9/06/81	249	-8.66	-14.61	21.2	1	4.4	195.0	3	--	--	8	58.5	225.5
9/08/81	251	-4.39	-12.14	21.9	1	0.4	188.0	3	23.1	--	8	61.9	217.0
9/13/81	256	-8.28	-15.53	20.8	-	--	--						

Corn Field # 2 Radar Data: $\theta = 50^{\circ}$, f = 10.2 GHz

Calendar Date	Julian Date	σ°_{vv} (dB)	σ°_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/19/81	139	-7.53	-18.39	30.9	5	78.5	30.8						
5/21/81	141	-9.60	-18.46	21.6	5	81.2	39.0						
5/27/81	147	-10.27	-19.12	18.6	5	87.8	63.0						
5/29/81	149	-7.99	-14.35	28.0	5	91.7	71.8						
6/03/81	154	-5.17	-11.83	31.5	5	91.1	74.3						
6/04/81	155	-4.65	-10.91	30.7	5	90.2	91.5						
6/05/81	156	-5.10	-12.85	30.8	5	91.2	107.7						
6/09/81	160	-5.12	-13.88	22.1	5	90.0	139.0						
6/12/81	163	-4.06	-12.11	30.9	5	91.0	165.0						
6/16/81	167	-6.76	-12.91	29.2	5	93.7	171.7						
6/18/81	169	-4.39	-11.84	27.4	5	--	173.0						
6/19/81	170	-5.74	-12.20	26.9	5	92.3	203.7						
6/24/81	175	-7.28	-11.43	30.7	6	87.5	227.0	4	73.6	238.0			
6/25/81	176	-7.01	-13.76	32.4	1	76.5	233.7	2	87.4	--	9	88.8	248.0
7/02/81	183	-7.79	-12.35	29.7	1	78.8	235.7	3	64.3	--	8	95.3	263.3
7/13/81	194	-8.30	-14.86	15.0	1	75.6	236.7	3	78.9	--	8	83.2	275.0
7/15/81	196	-9.73	-16.48	14.0	1	74.1	233.7	3	69.5	--	8	80.7	264.0
7/16/81	197	-7.79	-14.05	11.5	1	74.9	240.7	3	78.8	--	8	79.9	278.0
7/20/81	201	-8.53	-13.69	33.2	1	72.5	237.3	3	71.3	--	8	80.6	259.7
7/23/81	204	-6.96	-13.02	30.9	1	77.4	243.7	3	80.9	--	8	83.3	275.7
7/28/81	209	-7.97	-14.13	31.1	1	76.7	255.7	3	55.7	--	8	84.0	281.7
7/29/81	210	-8.64	-14.79	30.4	1	71.4	241.3	3	52.9	--	8	83.9	272.0
7/30/81	211	-7.64	-13.70	31.1	1	78.8	244.0	3	47.0	--	8	81.0	278.0
8/04/81	216	-8.66	-15.02	30.4	1	74.1	240.0	3	71.4	--	8	83.7	271.7
8/11/81	223	-8.67	-15.13	25.7	1	73.9	255.7	3	39.4	--	8	89.2	287.0
8/12/81	224	-6.31	-17.36	23.0	1	85.7	24.3						
8/13/81	225	-6.29	-16.44	17.2	5	--	19.8						

Corn Field # 3 Radar Data: $\theta = 50^{\circ}$, f = 10.2 GHz

Calendar Date	Julian Date	σ°_{vv} (dB)	σ°_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/19/81	139	-7.45	-18.21	25.9	5	77.9	23.3						
5/21/81	141	-8.70	-17.66	27.6	5	81.4	31.0						
5/26/81	146	-10.55	-18.50	23.6	5	87.2	41.7						
5/27/81	147	-11.90	-18.76	21.8	5	87.4	48.0						
5/29/81	149	-5.27	-13.02	25.8	5	88.0	43.7						
6/03/81	154	-5.42	-12.48	27.9	5	89.6	57.5						
6/04/81	155	-5.89	-12.24	28.0	5	90.4	80.7						
6/05/81	156	-7.27	-14.32	25.4	5	89.5	78.3						
6/09/81	160	-5.94	-12.09	22.0	5	91.1	97.0						
6/12/81	163	-6.10	-12.35	24.3	5	90.8	118.0						
6/16/81	167	-5.90	-12.25	27.7	5	93.1	144.7						
6/18/81	169	-6.61	-12.46	21.9	5	91.8	157.7						
6/19/81	170	-5.49	-12.45	24.0	5	91.0	163.0						
6/25/81	176	-7.08	-12.93	25.5	5	88.2	200.7						
7/02/81	183	-7.07	-12.13	21.0	1	80.2	245.0	8	87.4	260.0	3	90.1	--
7/13/81	194	-7.85	-14.50	10.4	1	75.7	241.3	3	80.0	--	8	82.3	267.3
7/15/81	196	-7.95	-14.91	9.3	1	75.8	256.3	3	74.8	--	8	86.1	268.0
7/16/81	197	-8.55	-14.50	6.2	1	79.1	249.7	3	84.1	--	8	82.2	277.3
7/20/81	201	-7.12	-13.49	20.3	1	76.0	251.3	3	73.5	--	8	83.5	283.7
7/23/81	204	-7.69	-14.45	17.1	1	79.6	242.7	3	88.1	--	8	85.1	267.7
7/28/81	209	-8.50	-15.96	22.9	1	77.1	253.7	3	64.6	--	8	83.1	280.0
7/29/81	210	-10.26	-17.22	23.5	1	77.2	247.7	3	66.6	--	8	84.8	275.7
7/30/81	211	-9.11	-15.96	20.6	1	78.2	250.7	3	64.0	--	8	83.9	278.3
8/04/81	216	-7.79	-14.64	17.7	1	76.4	239.7	3	64.9	--	8	83.7	260.5
8/05/81	217	-6.41	-12.86	26.1	1	77.1	245.0	3	54.9	--	8	84.4	259.3
8/11/81	223	-7.11	-14.56	22.8	1	77.6	240.7	3	43.1	--	8	83.2	255.0
8/13/81	225	-7.28	-14.63	21.7	1	78.0	242.0	3	45.0	--	8	82.9	253.3
8/24/81	236	-7.89	-14.85	9.9	1	40.9	239.5	3	34.6	--	8	77.8	262.5
8/28/81	240	-9.28	-15.63	23.5	1	16.5	245.0	3	48.4	--	8	72.8	259.0
8/30/81	242	-9.11	-16.06	20.8	1	6.7	--	3	27.3	--	8	80.0	--
9/01/81	244	-8.59	-13.65	13.9	1	24.7	252.0	3	23.9	--	8	78.1	257.0
9/03/81	246	-8.86	-13.81	17.2	1	10.4	252.5	3	62.4	--	8	74.1	261.5
9/06/81	249	-6.65	-12.00	17.8	5	72.6	--						

Corn Field # 4 Radar Data: $\theta = 50^{\circ}$, f = 10.2 GHz

Calendar Date	Julian Date	σ°_{vv} (dB)	σ°_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/19/81	139	-7.77	-19.52	26.5	5	73.9	31.7						
5/21/81	141	-5.56	-15.11	24.9	5	84.7	38.3						
5/27/81	147	-8.29	-14.94	19.2	5	87.9	61.3						
5/29/81	149	-4.77	-12.42	25.0	5	89.1	76.7						
6/03/81	154	-5.32	-12.18	32.4	5	91.3	91.3						
6/04/81	155	-5.26	-11.82	29.9	5	91.7	101.0						
6/05/81	156	-6.20	-13.55	33.2	5	91.6	113.3						
6/09/81	160	-4.63	-11.99	21.2	5	90.6	139.7						
6/12/81	163	-5.97	-11.72	25.0	5	90.5	170.8						
6/16/81	167	-6.52	-12.17	28.1	5	92.5	209.3						
6/18/81	169	-5.38	-11.03	25.7	5	90.3	184.7						
6/19/81	170	-5.27	-12.12	24.2	5	89.9	201.3						
6/25/81	176	-6.34	-12.60	25.6	1	78.3	255.0	2	87.6	--	9	82.5	261.0
7/02/81	183	-6.71	-12.06	23.6	1	79.4	253.7	8	85.9	272.0	3	89.6	--
7/13/81	194	-7.93	-15.49	11.7	1	75.5	251.3	3	74.9	--	8	82.3	274.7
7/15/81	196	-6.93	-13.99	12.0	1	72.7	253.3	3	82.5	--	8	79.7	280.7
7/16/81	197	-8.52	-14.57	11.3	1	76.7	257.7	3	73.7	--	8	78.7	299.0
7/20/81	201	-6.17	-13.13	20.9	1	75.6	267.0	3	68.0	--	8	80.6	300.7
7/23/81	204	-6.68	-14.44	20.6	1	76.7	262.7	3	93.2	--	8	83.5	283.3
7/28/81	209	-7.18	-14.13	28.2	1	75.6	261.3	3	55.7	--	8	80.0	292.7
7/29/81	210	-7.11	-14.16	28.8	1	76.8	258.0	3	53.5	--	8	79.8	298.0
7/30/81	211	-6.54	-13.39	34.2	1	78.4	256.0	3	56.3	--	8	83.0	286.0
8/04/81	216	-7.72	-14.97	30.9	1	75.0	272.0	3	57.1	--	8	79.6	299.3
8/05/81	217	-7.24	-13.20	29.2	1	71.7	255.0	3	71.5	--	8	81.1	287.3
8/07/81	219	-8.99	-17.94	28.7	1	75.8	257.3	3	54.5	--	8	78.9	291.7
8/11/81	223	-7.03	-14.99	24.7	1	74.2	259.0	3	41.2	--	8	79.4	281.3
8/13/81	225	-6.97	-13.63	28.8	1	75.7	237.7	3	43.1	--	8	79.0	276.0

Corn Field # 5 Radar Data: $\theta = 50^{\circ}$, f = 10.2 GHz

Calendar Date	Julian Date	σ°_{vv} (dB)	σ°_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/19/81	139	-8.80	-17.76	24.2	5	76.0	28.2						
5/21/81	141	-8.05	-15.21	20.9	5	83.5	38.7						
5/26/81	146	-7.06	-15.92	18.0	5	88.1	51.3						
5/27/81	147	-6.73	-13.98	14.7	5	85.8	63.2						
5/29/81	149	-6.00	-12.25	19.4	5	89.2	54.7						
6/03/81	154	-5.74	-11.99	25.0	5	90.6	79.3						
6/04/81	155	-5.73	-12.59	26.9	5	91.7	92.8						
6/05/81	156	-5.03	-13.99	23.0	5	90.2	93.3						
6/09/81	160	-4.23	-12.58	19.7	5	90.9	114.3						
6/12/81	163	-5.79	-13.35	22.8	5	90.3	132.3						
6/16/81	167	-6.71	-12.76	26.2	5	92.3	160.7						
6/18/81	169	-5.19	-11.85	18.9	5	91.4	185.3						
6/19/81	170	-5.39	-13.44	19.4	5	92.1	171.3						
6/24/81	175	-6.30	-12.05	20.6	6	88.0	203.7	4	69.4	71.3			
6/25/81	176	-5.61	-12.06	20.1	1	77.9	203.5	2	86.4	--	9	82.6	224.0
7/02/81	183	-6.56	-11.51	22.3	1	79.5	237.3	8	84.2	271.3	3	89.1	--
7/13/81	194	-6.82	-13.27	7.7	1	73.5	241.7	3	76.9	--	8	83.1	261.3
7/15/81	196	-8.71	-15.36	4.4	1	73.1	236.3	3	77.4	--	8	80.8	268.7
7/16/81	197	-6.66	-13.21	6.2	1	74.6	232.3	3	76.4	--	8	81.1	253.0
7/20/81	201	-6.85	-12.70	21.1	1	73.2	248.5	3	64.3	--	8	82.4	275.5
7/23/81	204	-7.58	-15.83	17.6	1	76.3	227.7	3	86.0	--	8	82.8	253.3
7/28/81	209	-6.84	-14.90	25.2	1	75.4	241.7	3	72.5	--	8	81.7	274.0
7/29/81	210	-7.11	-14.66	25.4	1	76.8	257.7	3	61.0	--	8	82.4	278.3
7/30/81	211	-8.12	-16.17	28.7	1	76.8	237.7	3	73.9	--	8	82.6	261.3
8/04/81	216	-6.94	-12.20	21.6	1	72.6	235.3	3	62.8	--	8	81.4	250.0
8/05/81	217	-6.42	-12.87	27.9	1	72.2	247.3	3	53.0	--	8	83.2	267.3
8/07/81	219	-7.49	-13.95	21.1	1	77.3	244.3	3	57.3	--	8	84.0	253.8
8/11/81	223	-7.18	-14.34	15.3	1	74.3	230.3	3	43.7	--	8	77.7	245.0
8/13/81	225	-7.32	-14.97	19.4	1	75.3	241.7	3	50.2	--	8	79.7	256.0
8/28/81	240	-8.11	-13.76	19.9	1	11.7	220.0	3	49.9	--	8	99.3	244.0
8/30/81	242	-8.73	-14.18	21.8	1	3.2	244.5	3	23.1	--	8	76.2	266.0
9/01/81	244	-6.18	-12.74	33.1	1	17.5	--	3	22.4	--	8	80.6	237.0
9/03/81	246	-5.05	-10.70	19.6	5	69.3	66.0						

Corn Field # 6 Radar Data: $\theta = 50^{\circ}$, f = 10.2 GHz

Calendar Date	Julian Date	σ°_{vv} (dB)	σ°_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/19/81	139	-6.20	-16.46	25.9	5	78.3	39.8						
5/22/81	142	-7.70	-15.96	21.6	5	86.7	39.7						
5/27/81	147	-7.55	-14.21	21.4	5	88.4	81.7						
5/29/81	149	-7.04	-13.39	24.5	5	89.8	60.0						
6/03/81	154	-5.54	-12.39	24.5	5	91.7	88.3						
6/04/81	155	-5.90	-12.15	24.6	5	91.8	107.3						
6/05/81	156	-6.03	-13.29	22.5	5	89.9	112.0						
6/09/81	160	-6.81	-14.67	30.3	5	91.4	144.0						
6/12/81	163	-5.02	-10.97	23.8	5	91.5	157.3						
6/15/81	166	-6.83	-13.99	26.9	5	16.3	182.3						
6/16/81	167	-7.44	-11.59	27.4	5	92.5	187.3						
6/18/81	169	-5.42	-12.77	18.2	5	92.5	179.3						
6/19/81	170	-5.99	-12.75	21.2	5	90.4	191.3						
6/24/81	175	-6.49	-11.94	18.2	6	88.7	226.3	4	73.0	236.7			
6/25/81	176	-5.67	-12.33	16.7	5	82.4	230.0						
6/26/81	177	-5.62	-11.37	22.2	1	83.4	255.0	2	90.1	--	9	91.9	259.0
7/13/81	194	-6.39	-13.54	12.2	1	76.9	241.0	3	83.8	--	8	82.3	270.7
7/16/81	197	-8.29	-15.05	7.2	1	76.3	275.7	3	80.8	--	8	80.8	289.0
7/17/81	198	-7.61	-14.17	11.2	1	78.3	254.0	3	74.9	--	8	81.8	284.3
7/21/81	202	-7.03	-13.09	--	1	78.4	249.7	3	83.1	--	8	83.6	280.0
7/23/81	204	-7.10	-13.25	13.6	1	75.2	254.7	3	80.7	--	8	83.1	285.3
7/28/81	209	-7.64	-14.29	25.5	1	77.8	262.0	3	67.1	--	8	83.8	289.0
7/29/81	210	-7.60	-15.05	26.6	1	74.4	252.0	3	63.8	--	8	81.9	273.3
7/30/81	211	-7.01	-14.16	20.7	1	76.4	246.0	3	80.5	--	8	79.6	282.3
8/04/81	216	-6.31	-12.56	23.3	1	73.0	248.7	3	64.7	--	8	82.6	283.3
8/05/81	217	-6.79	-13.05	27.0	1	71.1	256.0	3	63.8	--	8	83.4	286.3
8/08/81	220	-7.76	-14.92	--	-	--	--						
8/10/81	222	-7.68	-15.53	23.9	1	72.0	257.3	3	40.9	--	8	81.5	277.0
8/11/81	223	-7.78	-13.73	20.7	1	72.3	253.7	3	47.8	--	8	82.0	265.3
8/14/81	226	-7.83	-15.19	20.0	1	73.2	250.0	3	48.0	--	8	76.8	275.3
8/30/81	242	-6.05	-13.61	20.2	1	29.8	261.0	3	27.4	--	8	64.4	--
9/02/81	245	-4.62	-12.58	23.9	1	18.2	247.5	3	26.4	--	8	74.8	269.5
9/04/81	247	-4.21	-12.76	--	1	13.1	248.5	3	21.1	--	8	72.7	266.5
9/06/81	249	-4.89	-13.84	20.7	1	18.7	263.5	3	82.5	--	8	70.9	284.5
9/09/81	252	-4.91	-13.86	23.7	1	--	240.0	3	--	--	8	73.7	268.5
9/15/81	258	-9.58	-16.23	--	1	--	246.0	3	--	--	8	54.3	278.5

Corn Field # 7 Radar Data: $\theta = 50^{\circ}$, f = 10.2 GHz

Calendar Date	Julian Date	σ°_{vv} (dB)	σ°_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/20/81	140	-12.16	-18.91	26.9	5	79.2	17.8						
5/22/81	142	-10.23	-18.09	17.2	5	85.9	28.2						
5/27/81	147	-13.34	-18.39	16.1	5	87.3	47.3						
5/29/81	149	-9.56	-16.22	21.6	5	87.4	48.0						
6/03/81	154	-4.43	-12.78	28.2	5	88.8	66.3						
6/04/81	155	-3.76	-11.01	33.5	5	89.1	52.7						
6/05/81	156	-5.12	-12.58	28.4	5	87.8	71.7						
6/09/81	160	-7.00	-13.75	15.7	5	87.8	90.3						
6/12/81	163	-5.17	-12.62	30.4	5	89.9	105.0						
6/15/81	166	-6.55	-13.90	31.2	5	89.7	126.7						
6/16/81	167	-5.40	-12.56	29.2	5	89.8	120.7						
6/18/81	169	-5.78	-13.03	22.3	5	91.1	149.3						
6/19/81	170	-5.29	-12.84	--	-	--	--						
6/25/81	176	-7.39	-14.14	26.1	5	88.4	179.0						
7/13/81	194	-7.09	-13.44	9.1	1	73.9	225.3	3	83.1	--	8	79.7	246.3
7/16/81	197	-- 8	-13.74	15.4	1	76.9	218.3	3	80.6	--	8	78.7	244.3
7/17/81	198	-8.13	-14.69	9.4	1	72.4	219.0	3	78.3	--	8	78.5	255.7
7/21/81	202	-8.43	-14.59	25.8	1	78.1	237.3	3	76.0	--	8	81.7	258.0
7/23/81	204	-7.01	-14.17	24.4	1	74.8	221.0	3	74.4	--	8	83.1	251.7
7/28/81	209	-8.55	-14.70	32.3	1	75.4	209.7	3	76.6	--	8	78.7	235.0
7/29/81	210	-8.81	-14.16	30.2	1	71.2	180.3	3	64.5	--	8	81.7	211.7
7/30/81	211	-7.99	-14.25	27.2	1	75.2	238.7	3	88.4	--	8	78.1	256.7
8/04/81	216	-8.48	-13.33	25.6	1	69.5	223.0	3	62.5	--	8	82.1	247.7
8/05/81	217	-6.90	-13.75	29.4	1	55.7	176.0	3	61.5	--	8	73.0	215.0
8/07/81	219	-8.76	-14.42	28.7	1	69.3	208.7	3	74.3	--	8	79.4	230.7
8/10/81	222	-8.06	-14.72	22.8	1	63.7	218.7	3	46.4	--	8	81.1	253.0
8/11/81	223	-8.21	-13.96	21.6	1	67.3	215.0	3	54.3	--	8	76.4	244.3
8/26/81	238	-8.74	-15.00	30.4	1	58.4	212.0	3	36.1	--	8	77.7	239.3
8/30/81	242	-9.02	-14.27	23.1	1	41.1	216.5	3	35.1	--	8	71.5	250.0
9/02/81	245	-7.32	-12.88	26.3	1	20.2	223.0	3	30.1	--	8	77.4	251.0
9/04/81	247	-6.44	-11.60	29.0	1	30.5	224.0	3	30.2	--	8	70.8	249.0
9/06/81	249	-8.64	-13.70	23.8	1	22.4	196.0	3	36.5	--	8	74.7	244.5
9/09/81	252	-6.25	-12.10	22.8	1	1.6	224.0	3	--	--	8	71.2	248.0
9/15/81	258	-7.92	-15.08	--	-	--	--						
9/16/81	259	-8.99	-15.75	16.4	-	--	--						

Corn Field # 8 Radar Data: $\theta = 50^{\circ}$, f = 10.2 GHz

Calendar Date	Julian Date	σ°_{vv} (dB)	σ°_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/20/81	140	-9.04	-16.79	31.7	5	78.8	25.3						
5/22/81	142	-9.24	-18.19	35.0	5	86.8	38.3						
5/28/81	148	-7.17	-16.82	23.1	5	87.9	51.0						
5/29/81	149	-7.39	-16.05	29.2	5	88.1	47.0						
6/04/81	155	-3.99	-11.34	43.2	5	89.1	67.0						
6/05/81	156	-4.93	-11.98	39.1	5	88.0	80.7						
6/09/81	160	-7.37	-15.12	44.7	5	86.9	89.3						
6/12/81	163	-5.46	-11.51	43.1	5	88.8	122.7						
6/15/81	166	-5.92	-12.48	44.7	5	87.9	115.7						
6/16/81	167	-5.66	-12.81	40.7	5	86.8	134.7						
6/18/81	169	-5.98	-13.83	34.7	5	88.5	141.0						
6/19/81	170	-5.04	-11.40	41.0	5	85.6	148.7						
6/24/81	175	-6.28	-11.73	36.3	6	83.6	168.3	4	64.6	193.7			
6/25/81	176	-6.16	-12.31	39.3	1	76.6	176.0	2	85.4	--	9	89.1	209.3
7/13/81	194	-6.67	-14.02	23.5	1	72.1	178.7	3	74.4	--	8	79.3	206.0
7/16/81	197	-6.91	-13.56	14.1	1	73.1	157.3	3	82.2	--	8	63.0	201.3
7/17/81	198	-6.58	-13.93	14.1	1	72.6	182.0	3	72.7	--	8	76.6	208.0
7/23/81	204	-8.41	-14.86	31.2	1	72.4	167.3	3	77.9	--	8	81.2	195.0
7/28/81	209	-6.11	-13.76	--	1	64.5	173.7	3	57.5	--	8	81.6	207.3
7/29/81	210	-7.24	-14.30	79.9	1	68.8	183.7	3	55.5	--	8	77.7	207.7
7/30/81	211	-7.41	-13.36	40.7	1	72.0	158.3	3	86.0	--	8	77.2	196.3
8/04/81	216	-7.08	-13.43	38.3	1	65.3	169.7	3	63.3	--	8	76.9	204.3
8/05/81	217	-7.71	-14.26	44.3	1	80.4	228.0	3	43.3	--	8	83.0	254.3
8/10/81	222	-7.62	-14.28	36.6	1	63.0	171.0	3	36.4	--	8	80.1	203.0
8/11/81	223	-8.24	-15.29	28.9	1	53.5	165.3	3	34.1	--	8	73.9	196.7
8/26/81	238	-4.72	-12.48	43.0	5	68.0	60.5						

Corn Field # 9 Radar Data: $\theta = 50^{o}$, f = 10.2 GHz

Calendar Date	Julian Date	σ^{o}_{vv} (dB)	σ^{o}_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/20/81	140	-9.29	-20.24	24.0	5	76.8	17.0						
5/22/81	142	-14.00	-22.76	15.0	5	85.6	26.0						
5/28/81	148	-12.97	-20.52	17.2	5	88.6	47.7						
5/29/81	149	-9.78	-17.63	14.1	5	89.4	54.8						
6/04/81	155	-5.24	-12.60	26.2	5	88.2	55.0						
6/05/81	156	-5.74	-12.99	21.7	5	89.9	72.3						
6/10/81	161	-7.00	-13.35	13.4	5	90.4	106.3						
6/12/81	163	-5.73	-12.78	27.3	5	91.0	123.0						
6/16/81	167	-5.92	-10.87	24.4	5	91.1	149.3						
6/19/81	170	-4.99	-12.25	21.0	5	90.0	163.7						
6/24/81	175	-6.08	-11.13	22.4	5	89.5	199.3						
6/25/81	176	-6.72	-12.47	23.3	5	89.0	186.3						
6/26/81	177	-7.51	-12.66	19.0	5	89.4	220.0						
7/13/81	194	-7.39	-13.65	11.3	1	77.4	244.7	3	81.7	--	8	83.2	277.3
7/16/81	197	-7.21	-13.96	11.5	1	77.4	254.0	3	82.8	--	8	81.7	275.7
7/17/81	198	-6.84	-13.09	8.9	1	75.0	244.7	3	80.1	--	8	82.0	271.7
7/24/81	205	-7.31	-14.46	18.6	1	77.7	263.3	3	73.2	--	8	84.7	286.3
7/28/81	209	-7.47	-14.72	25.9	1	76.0	244.7	3	78.0	--	8	84.7	270.0
7/29/81	210	-7.48	-13.83	25.1	1	75.4	251.3	3	68.8	--	8	82.9	273.7
7/31/81	212	-7.44	-13.89	22.1	1	76.0	242.3	3	72.0	--	8	84.7	260.3
8/04/81	216	-7.33	-13.88	21.6	1	72.6	248.0	3	81.5	--	8	84.6	272.3
8/05/81	217	-7.04	-14.09	25.7	1	74.9	239.7	3	73.8	--	8	83.6	249.7
8/10/81	222	-7.54	-15.29	21.2	1	73.2	251.3	3	42.9	--	8	82.6	268.0
8/11/81	223	-7.36	-14.52	22.0	1	64.3	259.3	3	47.3	--	8	78.9	273.7
8/14/81	226	-9.01	-16.06	--	-	--	--						
8/26/81	238	-9.02	-15.78	22.9	1	41.6	246.5	3	56.5	--	8	78.2	262.5
8/30/81	242	-9.16	-15.31	21.7	1	14.9	228.5	3	24.7	--	8	70.4	247.0
9/02/81	245	-8.79	-14.94	21.5	-	--	--						
9/04/81	247	-9.12	-14.67	20.1	-	--	--						
9/06/81	249	-10.44	-16.00	18.0	1	50.2	252.0	3	20.2	--	8	69.6	261.0
9/10/81	253	-4.86	-12.51	21.8	5	46.0	47.0						
9/13/81	256	-5.52	-14.67	19.0	-	--	--						

Corn Field # 10 Radar Data: $\theta = 50^{o}$, f = 10.2 GHz

Calendar Date	Julian Date	σ^{o}_{vv} (dB)	σ^{o}_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/20/81	140	-4.27	-12.72	25.2	5	75.3	29.8						
5/22/81	142	-4.23	-12.58	26.0	5	85.0	31.3						
5/28/81	148	-8.34	-13.09	18.5	5	88.9	53.7						
5/29/81	149	-8.06	-13.81	23.0	5	89.3	56.0						
6/09/81	160	-8.09	-16.45	26.3	5	89.9	101.7						
6/12/81	163	-8.43	-13.89	26.2	5	90.0	142.3						
6/16/81	167	-5.79	-13.14	25.1	5	89.9	146.0						
6/18/81	169	-6.37	-14.03	21.3	5	92.1	162.3						
6/19/81	170	-5.24	-12.39	30.9	5	88.9	161.7						
7/13/81	194	-6.02	-13.57	14.7	1	76.4	234.0	3	83.6	--	8	81.5	262.3
7/16/81	197	-7.33	-14.09	12.2	1	74.5	235.7	3	80.1	--	8	79.3	264.3
7/17/81	198	-6.33	-12.89	8.4	1	74.6	239.7	3	81.2	--	8	78.8	262.7
7/21/81	202	-8.37	-15.53	24.7	1	74.0	226.3	3	83.6	--	8	79.9	258.7
7/23/81	204	-7.76	-15.01	22.7	1	75.7	224.0	3	73.1	--	8	76.7	249.3
7/28/81	209	-7.40	-14.05	54.7	1	77.5	227.3	3	68.9	--	8	80.3	243.3
7/29/81	210	-7.93	-16.09	28.2	1	74.0	242.7	3	64.9	--	8	79.7	267.7
7/30/81	211	-6.67	-13.83	32.0	1	77.2	227.7	3	72.4	--	8	79.5	253.0
8/04/81	216	-7.11	-12.36	29.2	1	72.2	235.7	3	70.2	--	8	81.7	265.3
8/07/81	219	-6.56	-13.82	29.2	1	68.4	--	3	54.0	--	8	80.3	--
8/10/81	222	-6.68	-14.23	27.6	1	71.3	245.0	3	51.1	--	8	81.4	269.7
8/11/81	223	-5.97	-12.82	22.3	1	70.1	234.3	3	48.2	--	8	79.7	262.0
8/14/81	226	-6.82	-14.27	27.4	1	70.5	252.7	3	39.2	--	8	78.5	276.3
8/24/81	236	-7.14	-14.30	14.3	1	40.9	232.3	3	31.3	--	8	74.1	255.5
8/30/81	242	-8.11	-14.16	--	1	33.5	--	3	27.0	--	8	76.4	268.0
9/02/81	245	-7.47	-14.22	27.2	1	13.0	240.0	3	27.9	--	8	76.5	262.0
9/04/81	247	-7.87	-12.62	--	1	6.8	246.0	3	--	--	8	76.9	266.0
9/06/81	249	-7.98	-14.63	20.9	1	12.8	227.0	3	22.4	--	8	84.7	251.5
9/09/81	252	-6.49	-13.15	25.2	1	1.2	235.5	3	--	--	8	69.5	269.5
9/15/81	258	-7.63	-13.99	22.0	1	0.6	242.5	3	--	--	8	67.7	271.0
9/16/81	259	-7.05	-13.91	15.4	1	0.5	240.5	3	--	--	8	64.8	258.0

Soybean Field # 1 Radar Data: $\theta = 50^{\circ}$, f = 10.2 GHz

Calendar Date	Julian Date	σ°_{vv} (dB)	σ°_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/21/81	141	-9.37	-23.62	--	-	--	--
5/26/81	146	-10.28	-24.33	22.4	-	--	--
5/27/81	147	-8.14	-16.99	16.2	-	--	--
5/28/81	148	-8.79	-16.95	18.2	-	--	--
6/03/81	154	-6.53	-14.28	28.8	-	--	--
6/04/81	155	-6.60	-14.75	24.9	-	--	--
6/05/81	156	-10.80	-19.86	22.5	-	--	--
6/09/81	160	-10.99	-19.54	18.8	-	--	--
6/12/81	163	-8.32	-15.78	25.6	-	--	--
6/16/81	167	-5.53	-16.09	28.6	-	--	--
6/18/81	169	-6.26	-15.01	19.4	5	88.5	22.0
6/19/81	170	-3.68	-12.73	25.2	-	--	--
6/25/81	176	-8.56	-15.31	20.0	5	82.2	31.7
7/02/81	183	-5.93	-11.79	26.1	5	83.5	45.0
7/13/81	194	-6.30	-12.45	6.1	5	83.5	61.0
7/15/81	196	-6.01	-11.97	8.5	5	80.4	69.0
7/16/81	197	-5.01	-12.66	4.8	5	81.6	66.7
7/20/81	201	-6.32	-11.78	25.5	5	80.1	86.7
7/23/81	204	-5.08	-11.33	21.6	5	85.0	82.5
7/28/81	209	-8.04	-16.40	31.9	5	82.1	88.7
7/29/81	210	-7.44	-16.00	32.3	5	82.6	90.3
7/30/81	211	-6.74	-13.89	27.3	5	83.0	94.7
8/03/81	215	-8.26	-14.52	28.4	5	83.2	101.0
8/06/81	218	-5.94	-13.79	34.7	5	81.2	108.7
8/10/81	222	-6.23	-12.98	27.0	5	81.8	108.7
8/12/81	224	-5.68	-12.63	24.3	5	80.6	109.3
8/13/81	225	-7.22	-14.08	37.2	5	82.5	101.7
8/24/81	236	-5.34	-11.39	11.7	5	76.6	131.0
8/28/81	240	-5.91	-12.76	25.5	5	74.6	105.5
8/30/81	242	-5.17	-12.42	21.7	5	78.4	102.0
9/01/81	244	-6.31	-12.96	--	5	77.7	100.0
9/03/81	246	-5.18	-11.43	26.3	5	76.3	92.5
9/08/81	251	-5.64	-12.10	25.2	5	72.6	115.5
9/10/81	253	-6.29	-12.04	22.5	5	76.3	101.5
9/13/81	256	-4.92	-10.68	20.8	5	73.4	96.0
9/15/81	258	-5.76	-12.41	18.6	5	72.9	102.5
9/16/81	259	-6.94	-12.99	19.6	5	77.2	86.0
9/17/81	260	-5.94	-11.60	12.7	-	--	--
9/21/81	264	-5.41	-11.46	11.2	5	70.2	88.0
9/23/81	266	-5.94	-10.50	10.5	5	75.9	97.0
9/28/81	271	-4.96	-9.71	21.2	5	68.4	90.0
10/02/81	275	-6.47	-11.22	18.6	5	50.3	107.0
10/05/81	278	-5.42	-10.58	25.4	5	40.9	115.5
10/07/81	280	-7.23	-13.18	21.3	5	38.3	117.0
10/14/81	287	-6.54	-11.69	31.3	5	18.2	109.0
10/19/81	292	-6.82	-13.97	24.4	5	8.5	112.5
10/21/81	294	-7.60	-15.50	21.4	-	--	--
10/23/81	296	-9.63	-19.69	--	-	--	--

Soybean Field # 2 Radar Data: $\theta = 50^{\circ}$, f = 10.2 GHz

Calendar Date	Julian Date	σ°_{vv} (dB)	σ°_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/21/81	141	-3.27	-17.82	--	-	--	--
5/26/81	146	-8.67	-16.72	22.0	-	--	--
5/27/81	147	-11.49	-21.44	19.4	-	--	--
5/28/81	148	-12.00	-21.15	20.9	-	--	--
6/03/81	154	-8.41	-18.86	24.7	-	--	--
6/04/81	155	-8.84	-18.90	23.5	-	--	--
6/05/81	156	-13.87	-22.12	20.0	-	--	--
6/09/81	160	-10.16	-20.12	16.9	-	--	--
6/12/81	163	-8.55	-16.51	20.0	-	--	--
6/16/81	167	-7.62	-14.38	21.1	-	--	--
6/18/81	169	-6.78	-14.24	19.5	5	83.6	25.0
6/19/81	170	-6.26	-12.61	17.7	-	--	--
6/25/81	176	-6.37	-12.82	21.2	5	80.1	33.0
7/02/81	183	-4.87	-10.32	22.2	5	81.2	52.7
7/13/81	194	-5.81	-12.46	6.7	5	82.4	73.0
7/15/81	196	-5.74	-12.39	2.7	5	79.5	78.3
7/16/81	197	-7.44	-12.70	5.3	5	78.0	76.0
7/20/81	201	-4.54	-12.29	16.5	5	80.9	83.7
7/23/81	204	-6.58	-13.03	9.9	5	81.8	96.0
7/28/81	209	-6.67	-14.53	5.2	5	80.4	97.3
7/29/81	210	-7.41	-14.96	22.9	5	80.9	107.0
7/30/81	211	-5.74	-13.04	28.4	5	75.3	98.7
8/03/81	215	-5.17	-11.83	24.3	5	80.9	120.3
8/05/81	217	-5.88	-13.83	21.7	5	81.2	113.3
8/07/81	219	-7.12	-12.38	22.2	5	80.3	108.7
8/11/81	223	-6.74	-12.80	24.0	5	79.1	134.7
8/13/81	225	-7.46	-14.21	18.0	5	80.6	116.0
8/24/81	236	-5.19	-11.75	9.7	5	75.2	125.0
8/28/81	240	-5.31	-12.76	15.4	5	75.0	121.0
8/30/81	242	-4.71	-11.06	12.8	5	74.3	122.5
9/01/81	244	-5.17	-11.82	18.1	5	74.1	125.5
9/03/81	246	-5.09	-11.74	13.4	5	72.7	114.5
9/08/81	251	-6.38	-13.14	43.3	-	--	--
9/13/81	256	-5.17	-10.02	11.5	5	77.2	118.0
9/15/81	258	-5.77	-10.93	13.1	5	61.7	112.5
9/17/81	260	-6.60	-11.55	8.1	5	57.9	109.0
9/21/81	264	-7.41	-11.86	5.1	5	28.6	111.0
9/23/81	266	-9.24	-13.60	5.9	5	27.8	114.0
9/28/81	271	-8.01	-14.46	13.0	5	12.1	103.5
10/02/81	275	-7.86	-14.71	12.1	5	5.6	98.0
10/05/81	278	-7.47	-14.32	16.8	5	6.3	123.5
10/07/81	280	-7.47	-14.92	11.4	5	7.5	109.0
10/14/81	287	-6.79	-14.74	18.0	5	22.2	110.5
10/19/81	292	-6.98	-13.74	18.3	5	7.0	103.0
10/23/81	296	-9.42	-17.47	16.0	5	17.5	105.0

Soybean Field # 3 Radar Data: $\theta = 50^{\circ}$, f = 10.2 GHz

Calendar Date	Julian Date	σ°_{vv} (dB)	σ°_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/21/81	141	-6.66	-21.31	36.6	-	--	--
5/26/81	146	-14.39	-21.65	25.2	-	--	--
5/27/81	147	-16.85	-24.80	19.7	-	--	--
5/28/81	148	-15.79	-24.04	21.6	-	--	--
6/03/81	154	-12.40	-20.35	26.7	-	--	--
6/04/81	155	-11.31	-18.76	23.4	-	--	--
6/05/81	156	-13.33	-21.29	25.0	-	--	--
6/09/81	160	-8.56	-16.31	18.9	-	--	--
6/12/81	163	-4.69	-12.35	22.9	-	--	--
6/16/81	167	-6.79	-11.48	26.5	-	--	--
6/18/81	169	-6.48	-13.64	21.4	5	86.7	29.0
6/19/81	170	-5.22	-10.67	22.1	-	--	--
6/25/81	176	-5.70	-13.25	20.1	5	82.8	45.0
6/26/81	177	-5.91	-12.46	19.5	-	--	--
7/13/81	194	-4.98	-12.53	5.1	5	81.0	80.3
7/15/81	196	-5.44	-12.59	4.8	5	77.3	85.3
7/17/81	198	-6.44	-13.49	6.3	5	83.1	86.7
7/22/81	203	-6.53	-13.69	24.5	5	82.5	88.0
7/23/81	204	-6.73	-13.79	18.5	5	81.5	74.0
7/28/81	209	-6.31	-14.86	28.3	5	79.9	95.0
7/29/81	210	-6.54	-14.20	26.0	5	79.0	103.0
7/30/81	211	-6.11	-13.26	25.8	5	79.5	89.7
8/03/81	215	-5.43	-12.38	24.7	5	79.0	116.7
8/06/81	218	-6.54	-12.89	30.6	5	81.5	102.0
8/07/81	219	-7.04	-13.60	27.9	5	79.3	89.3
8/10/81	222	-5.74	-12.99	27.6	5	77.7	98.3
8/11/81	223	-7.04	-13.04	22.3	5	77.2	108.3
8/13/81	225	-6.62	-13.18	21.2	5	77.8	83.5
8/24/81	236	-5.34	-11.90	12.0	5	72.8	88.5
8/28/81	240	-5.66	-11.51	25.0	5	71.1	105.0
8/30/81	242	-4.34	-10.49	18.6	5	73.0	111.0
9/01/81	244	-6.14	-12.29	26.8	5	76.2	92.0
9/03/81	246	-4.84	-11.89	23.4	5	70.9	100.0
9/08/81	251	-5.30	-10.56	--	5	68.5	101.5
9/10/81	253	-4.07	-8.92	22.9	5	79.8	95.0
9/13/81	256	-4.00	-8.65	22.9	5	61.5	116.5
9/15/81	258	-4.99	-10.85	23.4	-	--	--
9/16/81	259	-5.54	-9.99	13.4	5	45.7	86.0
9/18/81	261	-6.64	-10.39	14.5	5	81.7	106.0
9/21/81	264	-6.14	-11.70	14.7	5	21.2	95.0
9/23/81	266	-6.74	-11.59	12.8	5	10.4	106.5
9/28/81	271	-6.98	-11.33	20.7	5	3.7	96.0
10/02/81	275	-6.56	-11.91	19.4	5	40.4	114.5
10/05/81	278	-5.29	-10.54	23.0	5	9.8	116.5
10/07/81	280	-6.19	-12.05	16.5	5	6.2	110.0

Soybean Field # 4 Radar Data: $\theta = 50^{\circ}$, f = 10.2 GHz

Calendar Date	Julian Date	σ°_{vv} (dB)	σ°_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
6/03/81	154	-8.98	-19.53	21.4	-	--	--
6/04/81	155	-9.92	-19.78	21.8	-	--	--
6/05/81	156	-11.95	-22.71	18.3	-	--	--
6/10/81	161	-15.07	-22.32	10.7	-	--	--
6/12/81	163	-10.87	-18.52	21.7	-	--	--
6/15/81	166	-10.86	-18.82	--	-	--	--
6/16/81	167	-11.10	-17.65	14.9	-	--	--
6/19/81	170	-7.02	-14.28	16.0	5	78.9	12.0
6/24/81	175	-6.94	-13.30	10.5	5	76.3	17.3
6/25/81	176	-9.33	-17.58	12.0	5	77.5	17.3
7/02/81	183	-5.54	-11.30	17.8	5	69.2	23.7
7/13/81	194	-4.80	-12.35	4.6	5	80.8	51.7
7/15/81	196	-6.21	-13.16	4.1	5	74.3	40.0
7/16/81	197	-5.58	-13.23	3.7	5	74.6	52.7
7/27/81	208	-6.81	-15.26	22.0	5	78.3	75.3
7/28/81	209	-6.22	-14.87	19.2	5	80.3	76.0
7/29/81	210	-5.79	-13.75	17.1	5	81.0	82.3
7/31/81	212	-6.80	-15.26	15.5	5	82.0	92.3
8/03/81	215	-6.26	-13.51	18.0	5	81.7	101.0
8/06/81	218	-6.84	-13.80	21.5	5	82.5	104.0
8/07/81	219	-5.71	-12.76	17.6	5	81.5	98.7
8/10/81	222	-6.14	-13.79	14.8	5	81.3	112.0
8/14/81	226	-7.59	-13.45	14.0	5	79.4	118.3
8/26/81	238	-6.34	-13.59	17.9	5	77.9	121.5
8/30/81	242	-5.88	-11.33	13.0	5	76.0	117.5
9/02/81	245	-5.51	-11.96	17.5	-	--	--
9/06/81	249	-5.57	-11.72	11.4	5	71.6	116.5
9/10/81	253	-5.47	-10.92	15.3	5	84.0	108.0
9/13/81	256	-4.00	-11.96	12.8	5	70.8	112.0
9/16/81	259	-6.70	-10.86	8.0	5	71.1	80.5
9/17/81	260	-6.01	-11.36	6.9	5	72.3	95.0
9/21/81	264	-4.77	-9.72	5.4	5	63.9	100.0
9/23/81	266	-6.34	-10.50	6.4	5	60.0	108.0
9/28/81	271	-6.61	-10.56	13.1	5	27.3	109.5
9/30/81	273	-6.71	-11.76	10.9	5	6.8	113.0
10/02/81	275	-7.53	-12.38	12.5	5	11.8	103.0
10/05/81	278	-7.11	-12.76	15.7	5	4.5	113.0
10/07/81	280	-10.17	-17.62	13.3	-	--	--

Soybean Field # 5 Radar Data: $\theta = 50^{\circ}$, f = 10.2 GHz

Calendar Date	Julian Date	σ°_{vv} (dB)	σ°_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/21/81	141	-7.39	-20.05	--	-	--	--
5/27/81	147	-12.30	-21.35	27.0	-	--	--
5/28/81	148	-12.44	-21.29	28.5	-	--	--
6/03/81	154	-9.61	-17.16	39.5	-	--	--
6/04/81	155	-7.84	-15.60	45.0	-	--	--
6/05/81	156	-9.62	-18.78	42.7	-	--	--
6/09/81	160	-7.25	-15.61	35.0	-	--	--
6/12/81	163	-3.99	-10.54	52.0	-	--	--
6/16/81	167	-6.87	-13.42	39.3	-	--	--
6/18/81	169	-7.17	-16.72	26.4	5	85.3	30.0
6/19/81	170	-4.82	-11.48	40.2	-	--	--
6/25/81	176	-11.22	-17.18	31.1	5	80.1	40.7
7/02/81	183	-4.33	-9.79	36.1	5	77.5	43.7
7/13/81	194	-4.54	-11.70	12.0	5	77.5	55.0
7/15/81	196	-4.47	-11.42	11.0	5	70.0	58.7
7/16/81	197	-4.88	-11.53	16.7	5	71.5	62.0
7/23/81	204	-4.94	-11.39	33.1	5	77.7	81.7
7/24/81	205	-5.93	-13.29	31.0	5	79.7	81.7
7/27/81	208	-4.40	-12.16	55.5	5	79.0	87.3
7/30/81	211	-5.88	-13.73	44.6	5	78.3	75.5
7/31/81	212	-5.79	-13.75	44.3	5	79.4	91.3
8/03/81	215	-4.64	-12.80	41.2	5	78.9	87.0
8/05/81	217	-5.28	-12.43	45.6	5	79.6	102.0
8/07/81	219	-7.91	-13.56	41.4	5	80.5	86.0
8/12/81	224	-6.12	-11.97	30.0	5	78.2	86.3
8/14/81	226	-6.27	-11.82	40.8	5	75.2	102.7
8/26/81	238	-6.06	-12.31	43.4	5	75.2	88.0
8/30/81	242	-4.97	-9.92	39.1	5	73.5	81.5
9/02/81	245	-5.30	-11.25	38.2	5	71.0	95.0
9/06/81	249	-6.07	-12.32	36.0	5	72.6	89.5
9/09/81	252	-4.89	-10.45	36.9	5	81.8	82.0
9/16/81	259	-5.32	-9.37	25.6	5	51.6	95.0
9/17/81	260	-5.89	-10.35	24.5	5	43.9	109.0
9/21/81	264	-5.37	-9.32	22.6	5	28.6	108.5
9/23/81	266	-7.24	-11.19	23.7	5	27.1	97.0
9/28/81	271	-6.42	-10.67	37.1	5	17.1	89.0
9/30/81	273	-6.67	-11.92	30.9	5	5.0	91.0
10/02/81	275	-8.95	-18.30	29.9	-	--	--

Soybean Field # 6 Radar Data: $\theta = 50^{\circ}$, f = 10.2 GHz

Calendar Date	Julian Date	σ°_{vv} (dB)	σ°_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
7/20/81	201	-7.06	-13.31	15.5	5	74.9	36.0
7/23/81	204	-6.94	-16.00	14.1	-	--	43.0
7/28/81	209	-6.38	-14.73	19.1	5	83.7	51.7
7/29/81	210	-8.27	-17.12	18.6	5	81.5	43.3
7/30/81	211	-6.39	-13.85	18.5	5	83.7	56.7
8/03/81	215	-6.81	-14.66	16.0	5	81.2	64.0
8/05/81	217	-5.81	-12.86	20.2	5	83.5	74.8
8/11/81	223	-6.68	-14.03	13.1	5	81.4	80.0
8/13/81	225	-7.23	-14.99	11.2	5	80.9	89.3
8/24/81	236	-7.58	-12.04	5.6	5	75.0	96.5
8/28/81	240	-7.87	-12.73	14.7	5	77.5	100.0
8/30/81	242	-6.78	-11.73	12.0	5	73.2	102.5
9/01/81	244	-7.14	-11.60	17.7	5	80.9	100.0
9/03/81	246	-6.27	-10.93	15.6	5	76.4	103.0
9/08/81	251	-6.22	-11.08	14.8	5	72.1	106.0
9/13/81	256	-4.94	-10.79	13.3	5	74.6	93.0
9/15/81	258	-5.98	-11.03	8.4	5	70.9	91.0
9/17/81	260	-6.72	-10.57	9.1	5	79.3	89.0
9/18/81	261	-6.44	-11.50	10.5	5	79.4	90.0
9/21/81	264	-6.37	-11.23	7.7	5	70.2	92.0
9/23/81	266	-7.18	-11.43	7.0	5	70.3	94.5
9/28/81	271	-6.25	-10.81	12.5	5	63.2	95.5
10/02/81	275	-7.87	-12.62	14.7	5	44.2	98.5
10/05/81	278	-9.28	-12.93	18.7	5	40.9	87.5
10/07/81	280	-8.95	-13.81	16.1	5	41.1	95.5
10/14/81	287	-7.08	-11.84	23.7	5	21.5	97.0
10/19/81	292	-8.59	-15.45	17.2	5	7.9	94.0
10/21/81	294	-10.63	-16.69	14.8	-	--	--

Soybean Field # 7 Radar Data: $\theta = 50^{\circ}$, f = 10.2 GHz

Calendar Date	Julian Date	σ°_{vv} (dB)	σ°_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
7/24/81	205	-11.12	-18.88	29.5	-	--	25.3
7/27/81	208	-20.63	-23.88	38.1	-	--	--
7/29/81	210	-10.26	-15.41	29.9	5	81.5	35.3
7/31/81	212	-11.06	-17.11	29.8	-	--	38.3
8/04/81	216	-7.72	-13.48	26.8	5	82.8	43.3
8/06/81	218	-7.23	-11.99	33.0	5	84.9	47.0
8/07/81	219	-8.56	-14.11	--	-	--	--

Soybean Field # 8 Radar Data: $\theta = 50^{\circ}$, f = 10.2 GHz

Calendar Date	Julian Date	σ°_{vv} (dB)	σ°_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
7/22/81	203	-7.92	-16.18	27.8	5	--	19.0
7/24/81	205	-9.84	-17.09	25.4	-	--	23.0
8/04/81	216	-6.22	-12.38	--	5	81.4	38.3
8/11/81	223	-6.53	-12.59	23.7	5	79.7	51.3
8/12/81	224	-7.15	-12.80	26.3	5	82.4	46.3
8/14/81	226	-6.81	-12.96	--	5	80.5	51.7
8/30/81	242	-6.31	-12.26	22.8	5	79.0	65.0
9/06/81	249	-5.87	-12.92	20.8	5	80.0	95.0
9/13/81	256	-4.80	-11.05	17.4	5	79.3	88.0
9/16/81	259	-5.62	-12.48	16.5	5	82.1	87.0
9/17/81	260	-6.44	-12.69	14.5	5	86.7	89.0
9/21/81	264	-5.87	-11.63	13.7	5	81.9	97.5
9/23/81	266	-6.03	-11.48	12.5	5	75.3	87.0
9/28/81	271	-5.77	-11.33	20.5	5	76.0	85.0
9/30/81	273	-4.46	-9.11	16.6	5	73.8	78.0
10/02/81	275	-6.55	-11.81	19.2	5	76.6	80.5
10/07/81	280	-6.50	-12.06	17.6	5	84.3	77.0
10/21/81	294	-8.40	-14.25	23.5	5	37.3	87.0
10/23/81	296	-9.38	-14.94	24.6	5	37.5	85.5
10/28/81	301	-8.23	-15.19	23.2	5	19.4	90.0
11/11/81	315	-7.36	-15.81	--	-	--	--

Soybean Field # 9 Radar Data: $\theta = 50^{o}$, f = 10.2 GHz

Calendar Date	Julian Date	σ^{o}_{vv} (dB)	σ^{o}_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
7/24/81	205	-9.02	-17.28	6.7	5	80.4	36.0
7/27/81	208	-6.82	-12.08	21.6	-	--	--
7/29/81	210	-5.76	-14.22	14.9	5	77.8	45.3
7/31/81	212	-6.37	-14.42	13.5	-	--	53.7
8/03/81	215	-6.96	-13.31	13.7	5	80.6	57.3
8/06/81	218	-5.93	-14.19	20.9	5	83.2	63.0
8/07/81	219	-6.85	-14.21	--	5	80.4	62.3
8/11/81	223	-6.79	-12.75	9.1	5	79.8	78.0
8/12/81	224	-5.50	-12.65	8.7	5	79.9	80.3
8/14/81	226	-5.46	-12.31	12.8	5	79.1	84.0
8/26/81	238	-6.68	-13.34	15.6	5	76.0	96.0
8/30/81	242	-5.63	-11.29	13.2	5	77.0	114.5
9/02/81	245	-5.06	-11.61	15.6	5	75.7	99.5
9/06/81	249	-5.16	-11.91	11.1	5	73.2	92.0
9/10/81	253	-5.27	-11.02	13.7	5	80.2	100.0
9/13/81	256	-4.47	-11.22	12.0	5	78.1	98.5
9/16/81	259	-5.56	-12.31	10.8	5	70.2	92.5
9/17/81	260	-5.05	-12.00	6.3	5	75.6	89.0
9/21/81	264	-4.90	-11.05	6.1	5	76.0	96.0
9/23/81	266	-4.77	-9.82	3.7	5	71.9	88.5
9/28/81	271	-4.81	-10.36	13.5	5	67.1	93.0
9/30/81	273	-5.02	-8.88	7.0	5	61.6	90.0
10/02/81	275	-6.60	-10.65	11.9	5	56.4	88.0
10/05/81	278	-6.13	-10.59	13.9	5	36.9	96.0
10/07/81	280	-7.09	-12.55	11.3	-	--	97.0
10/14/81	287	-6.88	-12.14	16.5	5	27.5	98.0
10/19/81	292	-8.32	-16.58	13.4	5	5.8	96.0
10/21/81	294	-9.58	-18.74	12.3	5	7.7	106.0
10/23/81	296	-11.98	-21.34	10.7	-	--	--

Soybean Field # 10 Radar Data: $\theta = 50^{\circ}$, f = 10.2 GHz

Calendar Date	Julian Date	σ^{o}_{vv} (dB)	σ^{o}_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
7/23/81	204	-6.76	-12.72	13.5	-	--	--
7/24/81	205	-8.38	-13.64	16.9	-	--	27.3
7/27/81	208	-3.55	-11.20	--	-	--	--
7/30/81	211	-5.86	-13.51	20.3	5	83.1	33.7
7/31/81	212	-6.18	-13.63	17.7	5	80.4	35.7
8/04/81	216	-6.56	-11.41	16.4	5	79.8	47.3
8/06/81	218	-5.67	-11.32	20.1	5	80.4	41.7
8/07/81	219	-5.44	-11.80	--	5	80.1	48.3
8/12/81	224	-5.88	-12.04	14.6	-	--	--
8/14/81	226	-5.39	-12.05	19.2	5	80.0	64.0
8/26/81	238	-5.66	-12.42	--	5	76.2	79.0
8/30/81	242	-5.95	-11.00	13.0	5	74.0	76.0
9/02/81	245	-6.80	-12.45	--	5	77.4	84.0
9/06/81	249	-6.48	-13.13	11.9	5	73.6	92.0
9/10/81	253	-6.98	-11.53	14.4	5	77.6	97.5
9/16/81	259	-6.50	-12.95	9.8	5	76.9	86.5
9/17/81	260	-7.04	-13.09	9.8	5	75.1	84.0
9/23/81	266	-6.01	-11.66	9.7	5	77.8	94.0
9/28/81	271	-6.02	-11.78	12.2	5	70.7	84.0
9/30/81	273	-4.78	-10.44	12.2	5	67.7	87.5
10/02/81	275	-6.58	-12.13	11.0	5	70.7	91.5
10/05/81	278	-5.16	-10.81	16.6	5	69.1	97.0
10/07/81	280	-6.64	-12.10	11.1	5	78.3	95.5
10/14/81	287	-5.23	-9.99	21.4	5	67.4	100.5
10/19/81	292	-7.50	-12.45	23.6	5	48.3	96.5
10/21/81	294	-8.30	-15.85	21.4	5	36.1	91.0
10/28/81	301	-8.58	-16.14	16.0	5	2.1	92.5

Soybean Field # 11 Radar Data: $\theta = 50^{o}$, f = 10.2 GHz

Calendar Date	Julian Date	σ^{o}_{vv} (dB)	σ^{o}_{vh} (dB)	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
7/22/81	203	-8.56	-17.92	--	5	--	6.0
8/03/81	215	-6.65	-13.61	20.2	5	83.4	64.7
8/05/81	217	-5.38	-12.03	22.4	5	84.4	70.3
8/07/81	219	-6.48	-14.23	--	5	84.1	72.3
8/11/81	223	-4.57	-12.92	9.7	5	87.4	71.0
8/28/81	240	-6.87	-12.53	15.3	5	78.5	113.0
8/30/81	242	-6.62	-12.48	24.0	5	77.7	--
9/01/81	244	-6.51	-13.06	17.0	5	77.5	101.5
9/03/81	246	-4.98	-11.43	13.6	5	78.3	114.0
9/08/81	251	-6.04	-12.30	18.2	5	76.5	110.5
9/13/81	256	-7.65	-12.10	6.5	5	78.2	111.0
9/15/81	258	-7.47	-13.32	4.9	5	72.7	97.5
9/17/81	260	-7.38	-14.83	4.4	5	72.0	97.0
9/18/81	261	-7.11	-13.26	4.2	5	63.7	96.0
9/21/81	264	-6.18	-11.23	3.7	5	65.4	93.5
9/23/81	266	-5.60	-10.76	3.1	5	68.7	98.0
9/28/81	271	-5.87	-11.42	12.3	5	51.7	103.5
10/02/81	275	-7.29	-12.94	13.1	5	43.2	97.5
10/05/81	278	-7.65	-12.00	20.5	5	30.8	101.5
10/07/81	280	-8.12	-12.87	15.6	5	33.4	100.5
10/14/81	287	-7.31	-13.46	20.7	5	24.1	103.0
10/19/81	292	-8.92	-15.48	17.5	5	13.7	101.0
10/21/81	294	-10.72	-16.98	15.3	-	--	--
10/23/81	296	-13.67	-22.52	--	-	--	--

APPENDIX III

Model data (30° - 70°) and associated ground-truth for the 1981 vegetation experiment.

Please Note: first line is the ground-truth data, second line is σ^{o}_{VV} and the third line is σ^{o}_{VH}.

Wheat Field # 4 Radar Data: f = 10.2 GHz

Calendar Date	Julian Date	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/06/81	126	23.8	5	77.6	93.67			
σ^o_{ovv} 30°	-17.56	40°	-16.21	50°	-14.54	60° -15.62	70°	-13.23
σ^o_{vh}	-22.41		-22.06		-21.49	-22.48		-18.82
5/15/81	135	29.3	6	72.6	102.00	4 62.2	86.00	
σ^o_{ovv} 30°	-15.72	40°	-16.24	50°	-17.61	60° -19.51	70°	-21.96
σ^o_{vh}	-18.67		-19.99		-20.86	-25.08		-24.75
5/20/81	140	37.4	6	65.4	102.00	4 60.3	80.00	
σ^o_{ovv} 30°	-13.58	40°	-15.96	50°	-17.70	60° -18.53	70°	-17.21
σ^o_{vh}	-18.42		-18.81		-20.85	-21.49		-24.31
5/27/81	147	34.8	6	67.4	99.67	4 64.3	73.33	
σ^o_{ovv} 30°	-13.68	40°	-15.11	50°	-16.19	60° -16.13	70°	-14.46
σ^o_{vh}	-18.93		-19.06		-20.75	-21.39		-24.36
6/10/81	161	38.7	6	60.9	101.00	4 51.5	73.33	
σ^o_{ovv} 30°	-16.75	40°	-16.90	50°	-14.20	60° -11.76	70°	-13.43
σ^o_{vh}	-21.60		-19.14		-17.56	-16.82		-19.93
6/17/81	168	38.1	6	54.1	89.00	4 20.5	59.67	
σ^o_{ovv} 30°	-12.14	40°	-11.13	50°	-11.40	60° -11.83	70°	-10.41
σ^o_{vh}	-16.29		-16.58		-16.75	-18.19		-17.41

Wheat Field # 5 **Radar Data: f = 10.2 GHz**

Calendar Date	Julian Date	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/06/81	126	21.7	5	76.1	84.17			
σ^o_{ovv}	30° -10.91	40°	-17.92	50°	-12.45	60° -13.53	70°	-14.56
σ^o_{vh}	-20.65		-25.37		-21.51	-21.99		-24.96
5/15/81	135	30.1	6	72.6	99.33	4 71.8	57.67	
σ^o_{ovv}	30° -11.25	40°	-15.60	50°	-13.84	60° -16.44	70°	-16.06
σ^o_{vh}	-17.80		-22.55		-20.29	-19.80		-23.16
5/28/81	148	28.8	6	72.3	97.67	4 70.5	87.00	
σ^o_{ovv}	30° -11.56	40°	-13.11	50°	-16.00	60° -16.59	70°	-16.84
σ^o_{vh}	-17.41		-18.86		-20.26	-22.96		-27.84
6/10/81	161	29.3	6	63.5	98.00	4 47.2	63.67	
σ^o_{ovv}	30° -14.39	40°	-16.23	50°	-18.47	60° -16.98	70°	-16.54
σ^o_{vh}	-18.54		-19.28		-20.92	-20.74		-21.34
6/17/81	168	32.6	6	47.4	88.00	4 30.1	54.67	
σ^o_{ovv}	30° -10.66	40°	-11.75	50°	-14.97	60° -16.85	70°	-19.41
σ^o_{vh}	-16.00		-16.30		-19.92	-21.81		-25.31

Wheat Field # 7 Radar Data: f = 10.2 GHz

Calendar Date	Julian Date	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	
5/06/81	126	16.4	5	61.6	81.83				
σ^o	30° -16.14	40°	-20.80	50°	-20.85	60°	-19.43	70°	-18.99
σ^o_{vv}	-21.08		-24.74		-24.81		-26.29		-27.79
σ^o_{vh}									
5/15/81	135	26.1	6	59.7	90.33	4	60.2	74.17	
σ^o	30° -11.06	40°	-13.82	50°	-17.85	60°	-15.35	70°	-18.05
σ^o_{vv}	-17.21		-17.17		-18.71		-19.71		-22.25
σ^o_{vh}									
5/20/81	140	28.3	6	54.6	96.33	4	63.3	86.00	
σ^o	30° -8.83	40°	-12.72	50°	-14.77	60°	-17.96	70°	-21.65
σ^o_{vv}	-15.27		-17.87		-19.02		-21.62		-24.95
σ^o_{vh}									
5/27/81	147	26.3	6	57.6	95.83	4	58.7	72.00	
σ^o	30° -10.24	40°	-11.47	50°	-9.47	60°	-8.33	70°	-5.56
σ^o_{vv}	-14.19		-14.52		-13.83		-12.69		-11.50
σ^o_{vh}									
6/10/81	161	28.6	6	50.8	95.67	4	28.6	71.33	
σ^o	30° -10.49	40°	-10.38	50°	-9.32	60°	-7.52	70°	-9.33
σ^o_{vv}	-13.33		-14.63		-11.17		-11.48		-13.32
σ^o_{vh}									
6/17/81	168	30.9	6	44.9	77.67	4	9.4	44.00	
σ^o	30° -6.24	40°	-7.14	50°	-7.53	60°	-6.74	70°	-10.51
σ^o_{vv}	-11.18		-11.49		-10.49		-11.81		-13.71
σ^o_{vh}									

Corn Field # 6 Radar Data: f = 10.2 GHz

Calendar Date	Julian Date	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/22/81	142	21.6	5	86.7	39.67						
σ^o_{vv} 30°	4.77	40°	-2.96	50°	-7.70	60°	-9.69	70°	-11.37		
σ^o_{vh}	-11.88		-14.31		-15.96		-16.75		-18.87		
5/29/81	149	24.5	5	89.8	60.00						
σ^o_{vv} 30°	3.09	40°	-4.58	50°	-7.04	60°	-8.93	70°	-11.50		
σ^o_{vh}	-9.75		-11.92		-13.39		-14.99		-18.30		
6/05/81	156	22.5	5	89.9	112.00						
σ^o_{vv} 30°	-1.21	40°	-4.29	50°	-6.03	60°	-7.28	70°	-9.16		
σ^o_{vh}	-9.75		-12.54		-13.29		-12.44		-16.46		
6/12/81	163	23.8	5	91.5	157.33						
σ^o_{vv} 30°	-3.73	40°	-4.82	50°	-5.02	60°	-6.56	70°	-9.80		
σ^o_{vh}	-9.17		-12.07		-10.97		-12.12		-14.50		
6/19/81	170	21.2	5	90.4	191.33						
σ^o_{vv} 30°	-2.46	40°	-4.75	50°	-5.99	60°	-6.12	70°	-8.45		
σ^o_{vh}	-10.80		-11.30		-12.75		-11.89		-14.35		
7/17/81	198	11.2	1	78.3	254.00	3	74.9	--	8	81.8	284.33
σ^o_{vv} 30°	-7.27	40°	-7.41	50°	-7.61	60°	-5.79	70°	-8.98		
σ^o_{vh}	-13.82		-14.26		-14.17		-11.84		-15.17		
7/21/81	202	--	1	78.4	249.7	3	83.1	--	8	83.6	280.0
σ^o_{vv} 30°	-4.68	40°	-7.88	50°	-7.03	60°	-6.91	70°	-8.09		
σ^o_{vh}	-11.82		-16.03		-13.09		-14.78		-14.59		
7/28/81	209	25.5	1	77.8	262.00	3	67.1	--	8	83.8	289.00
σ^o_{vv} 30°	-3.67	40°	-7.10	50°	-7.64	60°	-7.46	70°	-10.87		
σ^o_{vh}	-11.11		-14.75		-14.29		-15.52		-17.86		
8/04/81	216	23.3	1	73.0	248.67	3	64.7	--	8	82.6	283.33
σ^o_{vv} 30°	-4.61	40°	-6.58	50°	-6.31	60°	-6.86	70°	-9.09		
σ^o_{vh}	-11.45		-11.83		-12.56		-13.23		-16.19		
8/10/81	222	23.9	1	72.0	257.33	3	40.9	--	8	81.5	277.00
σ^o_{vv} 30°	-8.08	40°	-7.68	50°	-7.68	60°	-7.24	70°	-9.19		
σ^o_{vh}	-16.93		-14.63		-15.53		-14.81		-16.89		
9/15/81	258	--	1	--	246.00	3	--	--	8	54.3	278.50
σ^o_{vv} 30°	2.20	40°	-5.76	50°	-9.58	60°	-9.98	70°	-12.90		
σ^o_{vh}	-9.25		-13.21		-16.23		-16.74		-19.09		

Corn Field # 7 Radar Data: f = 10.2 GHz

Calendar Date	Julian Date	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/22/81	142	17.2	5	85.9	28.17						
σ^o 30°		-0.16	40°	-7.35	50° -10.23	60°	-12.30	70°	-14.25		
σ^o_{vv}		-12.91		-17.49	-18.09		-21.06		-21.05		
σ^o_{vh}											
5/29/81	149	21.6	5	87.4	48.00						
σ^o 30°		-4.90	40°	-9.33	50° -9.56	60°	-10.37	70°	-14.00		
σ^o_{vv}		-13.34		-15.98	-16.22		-16.83		-18.60		
σ^o_{vh}											
6/05/8	156	28.4	5	87.8	71.67						
σ^o 30°		--	40°	-3.37	50° -5.12	60°	-6.55	70°	-9.63		
σ^o_{vv}		-9.35		-10.62	-12.58		-13.42		-16.83		
σ^o_{vh}											
6/12/81	163	30.4	5	89.9	105.00						
σ^o 30°		-3.01	40°	-3.35	50° -5.17	60°	-5.88	70°	-9.11		
σ^o_{vv}		-11.36		-10.70	-12.62		-13.24		-15.91		
σ^o_{vh}											
6/19/81	170	--	--	--	--						
σ^o 30°		2.50	40°	-3.75	50° -5.29	60°	-7.10	70°	-8.07		
σ^o_{vv}		-9.54		-11.70	-12.84		-12.56		-14.07		
σ^o_{vh}											
7/17/81	198	9.4	1	72.4	219.00	3	78.3	--	8	78.5	255.67
σ^o 30°		-4.43	40°	-7.48	50° -8.13	60°	-7.36	70°	-10.65		
σ^o_{vv}		-12.18		-13.83	-14.69		-14.23		-16.25		
σ^o_{vh}											
7/21/81	202	25.8	1	78.1	237.33	3	76.0	--	8	81.7	258.00
σ^o 30°		-2.68	40°	-8.02	50° -8.43	60°	-6.52	70°	-10.32		
σ^o_{vv}		-10.73		-14.77	-14.59		-14.19		-16.52		
σ^o_{vh}											
7/28/81	209	32.3	1	75.4	209.67	3	76.6	--	8	78.7	235.00
σ^o 30°		-0.64	40°	-10.62	50° -8.55	60°	-8.24	70°	-10.01		
σ^o_{vv}		-8.98		-19.47	-14.70		-16.21		-17.21		
σ^o_{vh}											
8/04/81	216	25.6	1	69.5	223.00	3	62.5	--	8	82.1	247.67
σ^o 30°		-3.11	40°	-7.74	50° -8.48	60°	-7.38	70°	-8.28		
σ^o_{vv}		-10.06		-12.79	-13.33		-13.75		-15.68		
σ^o_{vh}											
8/10/81	222	22.8	1	63.7	218.67	3	46.4	--	8	81.1	253.00
σ^o 30°		-6.35	40°	-7.48	50° -8.06	60°	-8.18	70°	-9.87		
σ^o_{vv}		-13.40		-14.83	-14.72		-15.05		-17.06		
σ^o_{vh}											

Corn Field # 10 Radar Data: f = 10.2 GHz

Calendar Date	Julian Date	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)	Plant Part #	Plant Moist (%)	Plant Ht (cm)
5/22/81	142	26.0	5	85.0	31.33						
σ^o_{vv} 30°	0.33	40°	-3.05	50°	-4.23	60°	-12.23	70°	-13.21		
σ^o_{vh}	-10.42		-13.39		-12.58		-18.00		-21.70		
5/29/81	149	23.0	5	89.3	56.00						
σ^o_{vv} 30°	-1.29	40°	-6.93	50°	-8.06	60°	-8.90	70°	-11.40		
σ^o_{vh}	-11.84		-13.28		-13.81		-15.57		-17.90		
6/12/81	163	26.2	5	90.0	142.33						
σ^o_{vv} 30°	-4.76	40°	-6.31	50°	-8.43	60°	-8.21	70°	-11.45		
σ^o_{vh}	-13.31		-13.66		-13.89		-13.98		-17.35		
6/19/81	170	30.9	5	88.9	161.67						
σ^o_{vv} 30°	-4.15	40°	-5.19	50°	-5.24	60°	-6.54	70°	-8.03		
σ^o_{vh}	-11.49		-13.64		-12.39		-13.00		-14.62		
7/17/81	198	8.4	1	74.6	239.67	3	81.2	--	8	78.8	262.67
σ^o_{vv} 30°	-5.91	40°	-6.72	50°	-6.33	60°	-6.91	70°	-8.17		
σ^o_{vh}	-13.26		-12.97		-12.89		-14.67		-15.17		
7/21/81	202	24.7	1	74.0	226.33	3	83.6	--	8	79.9	258.7
σ^o_{vv} 30°	-5.32	40°	-5.80	50°	-8.37	60°	-6.41	70°	-8.44		
σ^o_{vh}	-13.57		-12.55		-15.53		-14.38		-15.13		
7/28/81	209	54.7	1	77.5	227.33	3	68.9	--	8	80.3	243.33
σ^o_{vv} 30°	-5.88	40°	-7.08	50°	-7.40	60°	-7.63	70°	-9.37		
σ^o_{vh}	-13.13		-15.03		-14.05		-14.09		-16.66		
8/04/81	216	29.2	1	72.2	235.67	3	70.2	--	8	81.7	265.33
σ^o_{vv} 30°	-6.05	40°	-7.18	50°	-7.11	60°	-6.75	70°	-8.17		
σ^o_{vh}	-11.50		-14.23		-12.36		-13.31		-14.76		
8/10/81	222	27.6	1	71.3	245.00	3	51.1	--	8	81.4	269.67
σ^o_{vv} 30°	-6.83	40°	-6.66	50°	-6.68	60°	-8.23	70°	-9.83		
σ^o_{vh}	-13.87		-14.40		-14.23		-15.89		-16.62		
9/15/81	258	22.0	1	0.6	242.50	3	--	--	8	67.7	271.00
σ^o_{vv} 30°	-2.35	40°	-6.18	50°	-7.63	60°	-10.22	70°	-12.31		
σ^o_{vh}	-10.19		-12.83		-13.99		-15.99		-18.60		

Soybean Field # 3 Radar Data: f = 10.2 GHz

Calendar Date	Julian Date	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)				
7/22/81	203	24.5	5	82.5	88.00				
σ^o_{ovv}	30° -3.48	40°	-6.56	50°	-6.53	60°	-9.23	70°	-13.09
σ^o_{vh}	-12.03		-14.31		-13.69		-15.19		-18.59
7/29/81	210	26.0	5	79.0	103.00				
σ^o_{ovv}	30° -3.47	40°	-4.55	50°	-6.54	60°	-9.21	70°	-11.84
σ^o_{vh}	-11.12		-13.10		-14.20		-16.08		-18.23
8/06/81	218	30.6	5	81.5	102.00				
σ^o_{ovv}	30° -3.88	40°	-4.79	50°	-6.54	60°	-8.67	70°	-11.33
σ^o_{vh}	-11.13		-12.54		-12.89		-13.83		-17.43
8/11/81	223	22.3	5	77.2	108.33				
σ^o_{ovv}	30° -3.41	40°	-4.66	50°	-7.04	60°	-8.72	70°	-12.09
σ^o_{vh}	-11.45		-12.01		-12.70		-14.49		-17.29
8/28/81	240	25.0	5	71.1	105.00				
σ^o_{ovv}	30° -4.00	40°	-3.89	50°	-5.66	60°	-7.21	70°	-10.05
σ^o_{vh}	-10.65		-10.54		-11.51		-13.58		-16.84
9/10/81	253	22.9	5	79.8	95.00				
σ^o_{ovv}	30° -3.33	40°	-4.12	50°	-4.07	60°	-5.63	70°	-7.93
σ^o_{vh}	-8.08		-8.76		-8.92		-10.60		-13.73
9/18/81	261	14.5	5	81.7	106.00				
σ^o_{ovv}	30° -7.20	40°	-5.98	50°	-6.64	60°	-7.01	70°	-8.71
σ^o_{vh}	-11.05		-10.23		-10.39		-11.18		-13.60
9/28/81	271	20.7	5	3.7	96.00				
σ^o_{ovv}	30° -4.30	40°	-5.19	50°	-6.98	60°	-7.39	70°	-8.47
σ^o_{vh}	-10.24		-10.24		-11.33		-12.05		-13.76
10/07/81	280	16.5	5	6.2	110.00				
σ^o_{ovv}	30° -3.24	40°	-4.85	50°	-6.19	60°	-7.88	70°	-9.24
σ^o_{vh}	-10.48		-10.50		-12.05		-12.74		-15.74

Soybean Field # 8 Radar Data: f = 10.2 GHz

Calendar Date	Julian Date	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)				
7/22/81	203	27.8	5	--	19.00				
σ^o_{vv}	30° -4.08	40°	-7.58	50°	-7.92	60°	-11.17	70°	-14.31
σ^o_{vh}	-12.63		-15.93		-16.18		-18.83		-20.20
8/11/81	223	23.7	5	79.7	51.33				
σ^o_{vv}	30° -5.54	40°	-6.45	50°	-6.53	60°	-8.72	70°	-11.90
σ^o_{vh}	-11.78		-12.60		-12.59		-14.49		-16.80
8/30/81	242	22.8	5	79.0	65.00				
σ^o_{vv}	30° -3.92	40°	-5.80	50°	-6.31	60°	-8.11	70°	-10.57
σ^o_{vh}	-10.77		-11.64		-12.26		-13.97		-15.66
9/28/81	271	20.5	5	76.0	85.00				
σ^o_{vv}	30° -5.11	40°	-5.83	50°	-5.77	60°	-7.39	70°	-9.76
σ^o_{vh}	-10.06		-10.88		-11.33		-12.55		-15.65
10/07/81	280	17.6	5	84.3	77.00				
σ^o_{vv}	30° -6.80	40°	-6.73	50°	-6.50	60°	-7.60	70°	-9.31
σ^o_{vh}	-12.35		-11.58		-12.06		-12.96		-14.90

Soybean Field # 11 Radar Data: f = 10.2 GHz

Calendar Date	Julian Date	Soil Moist (%)	Plant Part #	Plant Moist (%)	Plant Ht (cm)				
7/22/81	203	--	5	--	6.0				
σ^o_{vv}	30° -2.84	40° -6.11		50° -8.56		60° -10.44		70° -12.97	
σ^o_{vh}	-10.38	-15.76		-17.92		-18.40		-19.96	
8/07/81	219	--	5	84.1	72.33				
σ^o_{vv}	30° -3.93	40° -5.49		50° -6.48		60° -9.38		70° -12.85	
σ^o_{vh}	-9.78	-13.64		-14.23		-15.14		-18.14	
8/11/81	223	9.7	5	87.4	71.00				
σ^o_{vv}	30° -2.10	40° -3.34		50° -4.57		60° -8.21		70° -10.99	
σ^o_{vh}	-10.05	-11.98		-12.92		-15.18		-16.89	
8/28/81	240	15.3	5	78.5	113.00				
σ^o_{vv}	30° -2.97	40° -3.22		50° -6 87		60° --		70° -9.93	
σ^o_{vh}	-11.12	-11.47		-12 53		--		-15.73	
9/18/81	261	4.2	5	63.7	96.00				
σ^o_{vv}	30° -6.69	40° -7.47		50° -7.11		60° -8.33		70° -9.81	
σ^o_{vh}	-11.14	-12.11		-13.26		-13.90		-15.50	
9/28/81	271	12.3	5	51.7	103.50				
σ^o_{vv}	30° -5.53	40° -6.17		50° -5.87		60° -6.33		70° -6.97	
σ^o_{vh}	-10.97	-11.21		-11.42		-11.29		-12.96	
10/07/81	280	15.6	5	33.4	100.50				
σ^o_{vv}	30° -4.14	40° -5.87		50° -8.12		60° -9.12		70° -10.14	
σ^o_{vh}	-10.78	-11.62		-12.87		-14.28		-17.04	

APPENDIX IV

Weather Observations for Study Area and Lawrence

APPENDIX IV
WEATHER OBSERVATIONS FOR STUDY AREA AND LAWRENCE

Date	Temp. F° MIN	Temp. F° MAX	Humidity %	Rainfall (cm) #1	#2	#3	#4	Lawrence (cm)	Wind Direction	Wind Speed (mph)	Notes
05/01/81	52	72	79	0	0	0	0	0	NE	18	Clear
05/02/81	47	80	70	0	0	0	0	0	S	18	
05/03/81	60	81	64	0	0	0	0	0	SSW	18	Wind gust 25-33
05/04/81	64	81	90	.25	1.20	0.5	0.8	T	S	12	Rain showers
05/05/81	50	70	94	NA+	NA	NA	NA	.71	N	14	
05/06/81	54	67	70	0	0	0	0	0	NE	15	Clear
05/07/81	44	67	84	0	0	0	0	0	ESE	12	
05/08/81	51	64	94	NA	NA	NA	NA	.05	SE	4	Overcast
05/09/81	52	67	100	3.0	3.0	3.1	3.2	1.90	NE	15	G*21
05/10/81	41	61	74	NA	NA	NA	NA	1.65	NE	17	G 22
05/11/81	36	68	NA	0	0	0	0	0	VBL	4	Partly cloudy, some frost
05/12/81	49	68	82	NA	NA	NA	NA	.02	VBL	8	
05/13/81	54	68	100	1.0	1.6	2.8	2.6	.40	NE	11	Rain showers
05/1 '81	48	69	95	NA	NA	NA	NA	2.63	N	13	Rain
05/15/81	50	74	73	0	0	0	0	0	SW	13	Clear
05/16/81	50	73	88	0	0	0	0	T.	SE	14	
05/17/81	53	61	100	NA	NA	NA	NA	1.06	SE	12	Rain showers

+NA = Not Available

*G = Wind Gust

Date	Temp. F° MIN	Temp. F° MAX	Humidity %	Rainfall (cm) #1	#2	#3	#4	Lawrence (cm)	Wind Direction	Wind Speed (mph)	Notes
05/18/81	53	58	100	4.4	5.0	6.7	5.6	2.07	N	18	G 24; rain showers
05/19/81	43	66	85	NA	NA	NA	NA	2.59	N	15	Partly cloudy
05/20/81	44	75	87	0	0	0	0	0	S	.04	Clear; heavy dew
05/21/81	51	77	75	0	0	0	0	0.	S	12	G 18; partly cloudy
05/22/81	62	81	65	0	0	0	0	T	S	18	Squall; G 50, damage, wind
05/23/81	50	84	92	NA	NA	NA	NA	4.73	SW	15	Rain showers
05/24/81	53	81	87	0	0	0	0	0	NW	16	
05/25/81	62	83	74	3.5	2.75	4.25	4.5	.02	SW	14	Rain; partly cloudy
05/26/81	59	83	94	NA	NA	NA	NA	.05	W	2	Clear to partly cloudy
05/27/81	62	82	90	T	T	T	T	0	VBL	5	Overcast
05/28/81	67	80	81	1.8	0.7	0.5	0.6	.02	VBL	14	Overcast
05/29/81	63	80	94	T	T	T	T	.58	SW	10	Partly cloudy
05/30/81	64	75	65	NA	NA	NA	NA	.02	NE	15	
05/31/81	52	78	87	0	0	0	0	0	VBL	14	
06/01/81	53	82	30	0	0	0	0	0	VBL	NA	Clear
06/02/81	66	80	90	1.7	1.2	2.0	2.2	T	NA	NA	Rain showers
06/03/81	61	82	80	NA	NA	NA	NA	4.07	S	.05	Clear night; severe storm

Date	Temp. F° MIN	Temp. F° MAX	Humidity %	Rainfall (cm) #1	#2	#3	#4	Lawrence (cm)	Wind Direction	Wind Speed (mph)	Notes
06/04/81	66	81	60	NA	NA	NA	NA	2.20	VBL	NA	Clear
06/05/81	67	86	80	0	0	0	0	0	VBL	NA	Partly cloudy
06/06/81	70	85		0	0	0	0	0	NA	NA	
06/07/81	66	89	80	0.8	0.8	0.5	0.8	0	NA	NA	Hot; humid; showers
06/08/81	72	93	60	NA	NA	NA	NA	.29	S	15	
06/09/81	74	91	70	0	0	0	0	0	S	15	Hot; humid; windy
06/10/81	66	75	60	0	0	0	0	0	VBL	NA	Cool; cloudy
06/11/81	60	68	80	2.0	2.2	2.4	2.4	.25	NA	NA	Rain showers
06/12/81	67	82	70	NA	NA	NA	NA	2.	NE	15	Partly cloudy
06/13/81	73	86	NA	NA	NA	NA	NA	NA	NA	NA	NA
06/14/81	78	85	NA	NA	NA	NA	NA	NA	NA	NA	NA
06/15/81	61	69	80	3.7	3.2	2.0	2.6	1.60	S	.05	Thunderstorms
06/16/81	56	71	30	NA	NA	NA	NA	.36	NNW	05	Clear
06/17/81	55	80	40	0	0	0	0	T	WNW	10	Clear
06/18/81	62	81	70	T	.6	.5	.9	0	S	10	Showers; partly cloudy
06/19/81	63	82	60	NA	NA	NA	NA	.53	SW	15	Rain; partly cloudy; hail
06/20/81	70	84	80	NA	NA	NA	NA	1.37	W	.05	Rain; partly cloudy

Date	Temp. F° MIN	Temp. F° MAX	X	Humidity %	Rainfall (cm) #1	#2	#3	#4	Lawrence (cm)	Wind Direction	Wind Speed (mph)	Notes
06/21/81	70	89		80	0	0	0	0	0	E	10	Rain showers; hail; svr. strm.
06/22/81	68	80		50	7.5	5.8	3.0	5.6	4.35	NNW	15	Rain showers
06/23/81	64	86		50	0	0	0	0	0	SSE	05	Clear to partly cloudy
06/24/81	75	90		40	0	0	0	0	0	NE	10	Clear
06/25/81	66	82		60	.1	T	T	T	.15	NNE	05	Partly cloudy, showers
06/26/81	68	79		70	NA	NA	NA	NA	.05	VBL	00	Clear
06/27/81	67	82		75	NA	NA	NA	NA	1.65	VBL	00	Clear
06/28/81	72	86		50	2.2	1.0	0.8	0.2	.51	SE	10	Partly cloudy, shower
06/29/81	74	88		80	4.7	6.0	1.7	2.6	NA	SW	05	Cloudy; heavy rain; severe storm.
06/30/81	69	77		65	NA	NA	NA	NA	4.25	E	05	Clear
07/01/81	70	83		95	0	0	0	0	0	N	08	
07/02/81	70	84		97	0	0	0	0	0	E	05	Fog; windy
07/03/81	74	79		93	0	0	0	0	0	SW	16	
07/04/81	71	75		95	NA	NA	NA	NA	.05	VBL	14	G 21
07/05/81	67	84		96	NA	NA	NA	NA	.05	N	8	Clear
07/06/81	69	84		96	0	0	0	0	0	NE	10	Partly cloudy
07/07/81	70	86		94	T	T	T	T	0	VBL	15	Brief squall

Date	Temp. F° MIN	Temp. F° MAX	Humidity %	Rainfall (cm) #1	#2	#3	#4	Lawrence (cm)	Wind Direction	Wind Speed (mph)	Notes
07/08/81	73	86	91	T	T	1.2	0.2	.13	S	14	G 19; brief squall
07/09/81	73	91	72	0	0	0	0	0	SW	13	Clear
07/10/81	75	93	87	0	0	0	0	0	SSW	14	Clear; partly cloudy
07/11/81	78	91	89	0	0	0	0	0	SW	19	G 25
07/12/81	78	95	84	0	0	0	0	0	S	14	G 22
07/13/81	77	93	42	0	0	0	0	0	SW	12	Clear; hot
07/14/81	76	95	42	0	0	0	0	0	SW	13	Clear; hot
07/15/81	79	93	61	0	0	0	0	0	SW	10	Partly cloudy
07/16/81	68	90	45	NA	NA	NA	NA	T	VBL	7	Clear to partly cloudy
07/17/81	74	86	70	0	0	0	0	0	S	5	Cloudy
07/18/81	70	81	86	NA	NA	NA	NA	1.78	S(VBL)	7	Partly cloudy
07/19/81	72	84	80	3.1	3.2	NA	3.4	.30	VBL	5	Shower
07/20/81	75	90	60	NA	NA	NA	NA	.40	NW	5	Clear
07/21/81	67	82	95	NA	NA	NA	NA	.05	SW	5	Partly cloudy
07/22/81	68	84	65	.6	T	NA	T	.63	SE	15	Light shower
07/23/81	73	86	55	NA	NA	NA	NA	.02	NE	11	Partly cloudy
07/24/81	73	86	55	0	0	0	0	0	VBL	12	Clear

Date	Temp. F° MIN	Temp. F° MAX	Humidity %	Rainfall (cm) #1	#2	#3	#4	Lawrence (cm)	Wind Direction	Wind Speed (mph)	Notes
07/25/81	68	88	55	NA	NA	NA	NA	1.83	S(VBL)	12	Clear day; Svr. storm g>55, hail
07/26/81	70	82	55	NA	NA	NA	NA	.05	NE	14	
07/27/81	68	77	77	12.8	12.8	12.8	12.8	9.49	VBL	8	Heavy rain; hail
07/28/81	62	65	65	NA	NA	NA	NA	2.89	N(VBL)	9	Clear
07/29/81	60	75	60	NA	NA	NA	NA	T	SE	8	Clear
07/30/81	64	79	65	0	0	0	0	0	S(VBL)	14	G 19; partly cloudy
07/31/81	70	77	78	NA	NA	NA	NA	T	SE	12	Partly cloudy
08/01/81	70	88	60	0	0	0	0	0	NA	15	Clear to partly cloudy
08/02/81	71	82	73	NA	NA	NA	NA	1.47	SW	11	Partly cloudy
08/03/81	72	84	60	NA	NA	NA	NA	.13	NE	10	Cloudy
08/04/81	74	90	50	2.0	2.6	3.2	3.0	0	SE	18	Rain; cloudy
08/05/81	71	90	63	1.4	T	1.0	1.6	.15	VBL	12	Cloudy, showers
08/06/81	70	73	90	NA	NA	NA	NA	.76	SW	12	Partly cloudy
08/07/81	67	77	40	NA	NA	NA	NA	1.88	NW	12	Clear
08/08/81	62	82	40	0	0	0	0	0	NW	10	Clear to partly cloudy
08/09/81	68	86	42	NA	NA	NA	NA	T	SW	2	Clear
08/10/81	67	79	40	NA	NA	NA	NA	.13	NNW	9	Clear
08/11/81	60	82	37	NA	NA	NA	NA	.07	VBL	00	Partly cloudy

Date	Temp. F° MIN	Temp. F° MAX	Humidity %	Rainfall (cm) #1	#2	#3	#4	Lawrence (cm)	Wind Direction	Wind Speed (mph)	Notes
08/12/81	65	86	42	0	0	0	0	0	SW	12	Cloudy
08/13/81	69	84	90	T	T	T	T	.13	SSE	10	Cloudy, showers
08/14/81	75	92	54	NA	NA	NA	NA	.33	SW	22	Clear; partly cloudy
08/15/81	74	90	57	0	0	0	0	0	VBL	15	
08/16/81	69	87	64	0	0	0	0	0	NE	14	
08/17/81	61	76	49	0	0	0	0	0	NE	18	
08/18/81	56	77	43	0	0	0	0	0	NE	13	
08/19/81	57	79	42	0	0	0	0	0	NE	9	
08/20/81	58	82	36	0	0	0	0	0	SE	2	
08/21/81	57	85	33	0	0	0	0	0	NE	2	
08/22/81	61	86	40	0	0	0	0	0	S	20	
08/23/81	65	84	80	NA	NA	NA	NA	T	S	10	
08/24/81	66	89	46	NA	NA	NA	NA	.07	NE	7	
08/25/81	67	89	100	NA	NA	NA	NA	1.35	VBL	8	
08/26/81	64	78	68	NA	NA	NA	NA	3.09	VBL	2	
08/27/81	63	77	62	NA	NA	NA	NA	T	NW	9	
08/28/81	63	79	67	NA	NA	NA	NA	.05	VBL	10	

Date	Temp. F° MIN	Temp. F° MAX	Humidity %	Rainfall (cm) #1	#2	#3	#4	Lawrence (cm)	Wind Direction	Wind Speed (mph)	Notes
08/29/81	63	86	45	0	0	0	0	0	S	15	
08/30/81	73	93	44	0	0	0	0	0	SW	24	
08/31/81	68	93	67	NA	NA	NA	NA	T	SW	10	
09/01/81	60	79	47	NA	NA	NA	NA	3.22	N	14	
09/02/81	53	77	45	0	0	0	0	0	NE	7	
09/03/81	59	86	48	0	0	0	0	0	VBL	5	
09/04/81	68	85	54	0	0	0	0	0	N	3	
09/05/81	64	85	52	0	0	0	0	0	VBL	11	
09/06/81	64	85	88	NA	NA	NA	NA	T	VBL	5	
09/07/81	67	76	54	NA	NA	NA	NA	2.33	VBL	16	
09/08/81	56	81	36	NA	NA	NA	NA	.02	NW	5	
09/09/81	56	83	36	0	0	0	0	0	SW	12	
09/10/81	60	85	37	0	0	0	0	0	S	18	
09/11/81	68	87	52	0	0	0	0	0	VBL	12	
09/12/81	64	88	40	0	0	0	0	0	VBL	2	
09/13/81	63	90	35	0	0	0	0	0	W	7	
09/14/81	66	89	51	0	0	0	0	0	VBL	12	

Date	Temp. F° MIN	Temp. F° MAX	Humidity %	Rainfall (cm) #1	#2	#3	#4	Lawrence (cm)	Wind Direction	Wind Speed (mph)	Notes
09/15/81	58	79	37	0	0	0	0	0	NNE	14	
09/16/81	48	76	37	NA	NA	NA	NA	T	NNE	20	
09/17/81	42	65	33	0	0	0	0	0	NNE	9	
09/18/81	44	70	30	0	0	0	0	0	S	9	
09/19/81	50	87	31	0	0	0	0	0	S	19	
09/20/81	57	84	31	0	0	0	0	0	SSW	16	
09/21/81	62	84	32	0	0	0	0	0	VBL	7	
09/22/81	57	83	55	0	0	0	0	0	E	12	
09/23/81	58	88	51	0	0	0	0	0	VBL	15	
09/24/81	68	83	97	NA	NA	NA	NA	.50	S	7	
09/25/81	68	80	64	NA	NA	NA	NA	1.04	S	14	
09/26/81	70	82	45	NA	NA	NA	NA	.71	VBL	16	
09/27/81	52	78	25	0	0	0	0	0	E	4	
09/28/81	51	80	35	0	0	0	0	0	SE	16	
09/29/81	69	90	31	0	0	0	0	0	SW	20	G 28
09/30/81	68	91	31	0	0	0	0	0	SW	24	G 30

Date	Temp. F° MIN	Temp. F° MAX	Humidity %	Rainfall (cm) #1	#2	#3	#4	Lawrence (cm)	Wind Direction	Wind Speed (mph)	Notes
10/01/81	52	91	78/19	NA	NA	NA	NA	.81	W	9	
10/02/81	41	74	85/32	0	0	0	0	0	E,Var	12	
10/03/81	52	66	56/96	NA	NA	NA	NA	.83	SE	18	
10/04/81	58	77	72/58	NA	NA	NA	NA	.07	S	8	
10/05/81	67	86	77/42	NA	NA	NA	NA	.20	S/W,Var	15	Thunder
10/06/81	49	68	95/31	0	0	0	0	0	N	11	
10/07/81	43	64	96/35	0	0	0	0	0	Var	12	
10/08/81	40	65	96/35	0	0	0	0	0	S	16	
10/09/81	54	58	67/100	NA	NA	NA	NA	.13	SE	calm	
10/10/81	52	69	100/50	NA	NA	NA	NA	T	NNE	6	
10/11/81	50	66	100/70	0	0	0	0	0	E	15	Foggy
10/12/81	57	63	100/97	NA	NA	NA	NA	1.17	SE	14	
10/13/81	62	66	98/	NA	NA	NA	NA	1.95	SE	14	
10/14/81	62	76	98/68	NA	NA	NA	NA	3.42	NE	4	
10/15/81	53	58	98/83	NA	NA	NA	NA	.05	NE	10	
10/16/81	53	63	97/96	NA	NA	NA	NA	.05	E, Var	10	
10/17/81	58	72	97/37	NA	NA	NA	NA	1.06	Var	17	

Date	Temp. F° MIN	Temp. F° MAX	Humidity %	Rainfall (cm) #1	#2	#3	#4	Lawrence (cm)	Wind Direction	Wind Speed (mph)	Notes
10/18/81	44	54	71/40	0	0	0	0	0	NW	18	G 27
10/19/81	37	69	83/33	0	0	0	0	0	S	11	
10/20/81	53	74	79/44	0	0	0	0	0	SW	25	
10/21/81	49	56	81/51	0	0	0	0	0	N	18	
10/22/81	37	50	76/41	0	0	0	0	0	N	8	
10/23/81	28	45	92/31	0	0	0	0	0	N	5	
10/24/81	31	59	68/53	0	0	0	0	0	S	14	
10/25/81	42	43	92/100	NA	NA	NA	NA	.71	NE	6	
10/26/81	32	57	100/40	0	0	0	0	0	Var	4	
10/27/81	38	68	98/41	0	0	0	0	0	S	13	
10/28/81	47	68	77/45	0	0	0	0	0	S	16	
10/29/81	50	73	77/45	0	0	0	0	0	S	22	
10/30/81	55	73	88/57	0	0	0	0	0	S	18	
10/31/81	55	60	99	NA	NA	NA	NA	.25	NE	12	
11/01/81	51	62	100/74	NA	NA	NA	NA	4.64	E/S,Var	12	Cloudy
11/02/81	49	62	94/63	0	0	0	0	0	E, Var	11	
11/03/81	48	60	99/67	NA	NA	NA	NA	T	calm	--	Foggy

Date	Temp. F° MIN	Temp. F° MAX	Humidity %	Rainfall (cm) #1	#2	#3	#4	Lawrence (cm)	Wind Direction	Wind Speed (mph)	Notes
11/04/81	48	51	100/99	NA	NA	NA	NA	1.22	S	7	Overcast
11/05/81	45	65	96/61	NA	NA	NA	NA	.05	NW	15	Clear
11/06/81	34	62	96/61	0	0	0	0	0	W	3	Clear
11/07/81	38	57	80/51	0	0	0	0	0	S	5	
11/08/81	42	54	100/99	NA	NA	NA	NA	.89	NE	18	G 26, ice pellets
11/09/81	29	48	70/32	NA	NA	NA	NA	.38	N	6	
11/10/81	30	58	71/34	0	0	0	0	0	SW	12	
11/11/81	36	63	98/46	0	0	0	0	0	Var	5	
11/12/81	37	65	99/40	0	0	0	0	0	E	3	

APPENDIX V

Periodic Ground-Truth Observations for 1981 Vegetation Experiment

Notes:

1. Bulk Density a = 0 - 7.5 cm
   b = 0 - 5.0 cm

2. Crop Damage

Scale	Type
0 - None	I - Insects
1 - Slight	W - Wind
2 - Moderate	H - Water
3 - Heavy	F - Frost
	L - Lodging

3. Weediness

   0 - None
   1 - Slight
   2 - Moderate
   3 - Heavy

4. Growth Stages are from AgRISTARS Enumerator's Manual, 1981, see Appendix VII.

5. Row Density = plants per meter of row.

Field	Date	Bulk Density	Crop Damage	Weediness	Growth Stage	Peak to Trough (cm)	Peak to Peak (cm)	Row Density	Row Spacing		Surface Roughness Dates	Notes
S1	05/21	1.26a				7.5	42.0				05/21	
	05/29				11			15.2	75.5		06/01	
	06/08	1.27b									06/17	
	07/01		2,1	0	23						09/23	
	07/08	1.26b										
	07/15				32							Some small plants; patchy
	08/14			0	42							
	09/15				44							
	10/05			1	52							
	10/20				61							
S2	05/21	1.24a				8.5	45.0				05/21	
	05/29				11			15.2	77.6		06/17	
	06/08	1.37b									09/23	
	07/01			1	23	4.0	71.3					
	07/08	1.18b										
	07/15				32							Full bloom
	08/14		1,1	2	50							
	09/01		1	1								
	09/15			1	51							
	10/05		0	1	52							
	10/20		1		52							

Field	Date	Bulk Density	Crop Damage	Weediness	Growth Stage	Peak to Trough (cm)	Peak to Peak (cm)	Row Density	Row Spacing		Surface Roughness Dates	Notes
S3	05/21	1.36a				5.5	40.0				05/21	
	06/01				11						06/17	
	06/08	1.26b									09/23	
	07/01		2,I	2	31	6.3	78.6					
	07/08	1.10b										
	07/15				32							
	08/14		1,I	2	43							Vines
	09/01			2	44							
	09/15				52							
	10/01				52							
	10/05		2	2-3								Ground-truth damage
	10/15				62							
	10/20											Replant with wheat
S4	05/21	1.22a										
	06/01				10						09/28	
	06/08	1.54b										
	07/08	1.50b	1,I	0	23	7.5	78.6	30.4	60.4			
	07/16				32							
	08/14		1,I	1	42							Vines
	09/03		1	1	44							

Field	Date	Bulk Density	Crop Damage	Weediness	Growth Stage	Peak to Trough (cm)	Peak to Peak (cm)	Row Density	Row Spacing		Surface Roughness Dates	Notes
S4-contd	09/15				51							
	10/05				60							
	10/20				61						-- -	Rough surface
S5	05/21	1.22a				7.0	77.0				5/21	
	06/01				11			24.4	72.8		6/01	
	06/08	1.00b									6/19	
	07/01			1	23						9/28	
	07/08	1.13b				2.5	55.6					
	07/16				32							
	08/14		2-3,I	2								
	09/03		1	1	44							
	09/15				51							
	10/05				61							
	10/20				62							
S6	07/20		1,I	1		1.3	72.3					
	08/14		1	2	32			25.6			9/28	
	09/01		1	1	43						--	
	09/15				44							
	10/05			3	52							
	10/20		1	1	52							8-10" stubble

Field	Date	Bulk Density	Crop Damage	Weediness	Growth Stage	Peak to Trough (cm)	Peak to Peak (cm)	Row Density	Row Spacing		Surface Roughness Dates	Notes
S7	07/20		1	1		2.3	81.1	17.2				
S8	07/20					5.1	78.0				9/28	
	08/14		1	2-3	31			7.0				
	09/03		2	3	42							
	10/05		1	2	51							
	10/20		1	2	52							8-10" stubble
S9	07/20		1	1		3.3	83.6	15.6				Vines
	08/14		1	1	41						9/28	Grasses
	09/03		1	1	43							
	09/15				44							
	10/05		1	1	51							
	10/20		1	1	52							8-10" stubble
S10	07/20		1,I	2-3		8.6	76.5					
	08/14		1,I	3	32			16.0			9/28	
	09/03		1	1	41							
	09/15				43							
	10/05		1	2	44							
	10/20		1	2	51							
S11	07/20		1,I	2-3								4-6" stubble
	08/14		1,I	3	32						9/23	

Field	Date	Bulk Density	Crop Damage	Weediness	Growth Stage	Peak to Trough (cm)	Peak to Peak (cm)	Row Density	Row Spacing		Surface Roughness Dates	Notes
S11-contd	09/03		1	1	41							
	09/15				43							
	10/05		1	2	44							Screens
	10/20		1	2	51							
S12	08/14		1,I	0-1	22							
	09/15				43						9/28	
	10/20		0	0	51							
C1	05/21	1.41a				5.0	85.0				5/2L	[Generally some corn worms and
	05/29				22	3.8	76.3	3.9	74.5		5/29	fungi in all fields]
	06/08	1.28b									6/19	
	07/01		2,W	0	33							
	07/08	1.23b										
	07/15				41							
	08/04		2,W	1	43							Leaves torn.
	09/01		0	1	44							
	09/15				63							
C2	05/21					10.5	18.5	3.6	74.2		5/21	
	05/25	1.22a				4.8	36.6				5/29	
	05/29				22-23						6/17	
	06/08	1.31b										

Field	Date	Bulk Density	Crop Damage	Weediness	Growth Stage	Peak to Trough (cm)	Peak to Peak (cm)	Row Density	Row Spacing		Surface Roughness Dates	Notes
C2-contd	07/01		2,W,I	0	33							
	07/08	1.33b										
	07/14				41-42							Upper cobs more developed.
	08/04		3,W	0	43-44							Torn leaves.
	09/01		1	1	61							
	09/15											
C3	05/21	1.29a				5.8	39.5					
	05/29				22	9.0	69.0	3.7	74.7			
	06/08	1.30b										
	07/01		2,W	0	33							
	07/08	1.37b										
	07/14				41-42						5/21	Upper cobs more developed.
	08/04			1	43						5/29	
	09/01		1	1	51						6/17	
	09/15				63						6/19	
C4	05/21	1.14a				9.0	54.6	5.3	74.5		5/21	
	05/29				22-23	4.8	48.0				5/29	
	06/08	1.24b									6/17	
	07/01			0	40						6/19	
	07/08	1.45b										

Field	Date	Bulk Density	Crop Damage	Weediness	Growth Stage	Peak to Trough (cm)	Peak to Peak (cm)	Row Density	Row Spacing		Surface Roughness Dates	Notes
C4-contd	07/14				41-42							Upper cobs more developed.
	08/04			1	43							
	09/01		0	1	51							
C5	05/21	1.29a				7.0	74.6				5/21	
	06/01				23						6/01	
	06/08	1.47b									6/17	
	07/01				33	8.8	74.0	3.6	75.6		6/19	
	07/08	1.35b										
	07/14				41							Upper cobs more developed.
	08/04			1	43							
	09/01		0	1	52							
	09/15				63						--	
C6	05/21	1.29a									5/21	
	05/29				23						6/17	
	06/08	1.50b									6/19	
	07/01		1,1	2	33	2.5	58.3	3.3	76.1			Worms
	07/08	1.40b										
	07/15				41-42							Upper cobs more developed.
	08/04			0-1	43							Vines
	09/01		1	1	51							

Field	Date	Bulk Density	Crop Damage	Weediness	Growth Stage	Peak to Trough (cm)	Peak to Peak (cm)	Row Density	Row Spacing		Surface Roughness Dates	Notes
C6-contd	09/15				52							
C7	05/21	1.47a				5.0	65.0				5/21	
	06/01				22-23			4.4	75.5		6/01	
	06/08	1.35b									6/19	
	07/01		1,W	1	40							
	07/08	1.24b				5.1	86.0					
	07/16				41-42							
	08/04			2	43							Vines
	09/03		0		43							
	09/15				63							
C8	05/21	1.20a				5.0	72.0	3.2	72.8		5/21	
	06/01				23	4.3	63.6				6/01	
	06/08	.81b									6/19	
	07/01			0	33							
	07/08	1.00b										
	07/16				42							
	08/04			1	43							Vines, broad leaves
	09/03		1	1	62							
C9	05/21	1.53a				6.5	38.0				6/19	
	06/01				23			3.8	75.6			

Field	Date	Bulk Density	Crop Damage	Weediness	Growth Stage	Peak to Trough (cm)	Peak to Peak (cm)	Row Density	Row Spacing		Surface Roughness Dates	Notes
C9-contd	06/08	1.37b										
	07/08	1.37b	2,W;1,I	0	33	2.5	78.6					
	07/16				41							Upper cobs more developed.
	08/04			0-1	43							
	09/03		1	1	51							
	09/15				63							
C10	05/21	1.27a				6.5	42.0				6/17	
	05/29				23			3.4	73.7		6/19	
	06/08	1.30b										
	07/08	1.47b	1,I	0	33	3.8	80.6					
	07/16				41							Upper cobs more developed.
	08/05			1	43							
	09/01		1	1	51							
	09/15				52							
	10/05				63							
W1	05/14			1	34						5/11	Den/m: sparse growth
	06/01	1.14a						77.4	17.4			
	06/04		1,D	1	42							Black heads, legumes
	06/08	1.28b										
	06/17			1	43							Mostly dry.
	07/08	1.35b										

Field	Date	Bulk Density	Crop Damage	Weediness	Growth Stage	Peak to Trough (cm)	Peak to Peak (cm)	Row Density	Row Spacing		Surface Roughness Dates	Notes
W1-contd	G7/14			1	61							Till; replant.
W2	05/14			1	34			93.6	23.2		5/11	Den/M; patchy distribution.
	06/01	1.34a		1								Grasses
	06/04			1	41							
	06/08	1.42b										
	06/17				43							Still partly green.
	07/08	1.46b			62							
	07/14											No till, high stubb., replant.
W3	05/14			1	34			161.6	19.6		5/11	Den/M; dense crops
	06/01	1.24a		1								
	06/04		2,W	0	42							
	06/08	1.13b										
	06/17			0	43							Moderately green.
	07/08	1.02b										
	07/14				61							[Straw/stubb.--cut while wet;
												bad ruts; some not harvested.]
W4	05/14			3	34			135.8	19.6			Dens/M; 1 @ 7Ø deg.; Ø elsewhere.
	06/01	1.03a										
	06/04		1,W	1	43							1 @ 7Ø deg.; Ø elsewhere.
	06/08	0.93b										

Field	Date	Bulk Density	Crop Damage	Weediness	Growth Stage	Peak to Trough (cm)	Peak to Peak (cm)	Row Density	Row Spacing		Surface Roughness Dates	Notes
W4-contd	06/17			2	41							1 @ 7Ø deg.; Ø elsewhere.
	07/08	1.08b										
	07/16											Straw/stubb.; some ruts.
W5	05/14			1	34						5/14	Dens/M
	06/01	1.07a						198.0	20.4			
	06/04		1,W	1	42							
	06/08	1.21b										
	06/17			1	43							
	07/08	1.10b										
	07/16			0	61							Some uncut; wet.
W6	05/14			0	34			136.6	19.0		5/14	Dens/M
	06/01	1.16a										
	06/04				42							
	06/08	1.25b										
	06/17			0	43							
	07/08	1.29b										
	07/16				61							Straw/tall stubb.; replant.
W7	05/14			0	34						5/11	
	06/01	1.40a						180.6	18.8			
	06/04				42							

Field	Date	Bulk Density	Crop Damage	Weediness	Growth Stage	Peak to Trough (cm)	Peak to Peak (cm)	Row Density	Row Spacing		Surface Roughness Dates	Notes
W7-contd	06/08	1.23b										
	06/17			0	43							
	07/08	1.40b										
	07/16				61							Replant; no till; shcrt stubb.
W8	05/14			1	34						5/11	Dens/m: some bare spots.
	06/01	1.30a						158.2	19.4			
	06/04		1,W	1	42							
	06/08	1.50b										
	06/17			2	43							
	07/08	1.48b										
	07/16											
W9	05/14			0	34						5/19	Dens/m
	06/01	1.36a						78.8	18.8			
	06/04			0	42							
	06/08	1.27b										
	06/17			0	43							
	07/08	1.54b										
	07/16				62							
W10	05/14			1	41			100.2	19.4		5/14	Dens/m; patchy growth.
	06/01	1.41a										

Field	Date	Bulk Density	Crop Damage	Weediness	Growth Stage	Peak to Trough (cm)	Peak to Peak (cm)	Row Density	Row Spacing		Surface Roughness Dates	Notes
W10-contd	06/04			1	42							
	06/08	1.32b										
	06/17			2								
	07/08	1.37b										
	07/16				62							Stub., replant, no till.

APPENDIX VI

Farm-Operator Reports for the 1981 Vegetation Experiment

APPENDIX VI: Farm-Operator Reports for the 1981 Vegetation Experiment

Field	Planting Date	Pesticide Used	Herbicide Used	Fertilizer Used No. # N, P, K	Field Preparation	Seed Variety	Harvest Date	Yield Bu/ Acre	Bu. Wt. Lbs.
W1	10/10/80	--	--	100# 28-12-20	Disc	Pioneer	6/27/81	54	62
W2	10/03/80	--	--	18-46-30 34-0-0	Disc	Newton	6/22/81	56.5	NA*
W3	10/10/80	--	--	18-46-30 34-0-0	Disc	Newton	6/25/81	42	NA
W4	10/04/80	--	--	150# 18-46-0 150# 33-0-0	Disc	Newton	7/03/81	44	55
W5	10/10/80	--	--	130# 34-0-0	Disc twice	Centurk	7/08/81	55	59
W6	10/02/80	--	--	120# 18-46-0 100# 33-0-0	Disc	Newton	7/02/81	58	58
W7	10/02/80	--	--	40# Nitro	Plowed	Newton	6/29/81	50	61
W8	09/19/80	--	--	60# Nitro	Disc twice	Scout	7/06/81	48	NA
W9	10/15/80	--	--	18-46-30 34-0-0	Disc	Soft wheat	6/18/81	48.3	NA
W10	09/20/80	--	--	40# Nitro	Disc	Newton	Frost Damage	0.	54
C1	04/06/81	Thimet	Lasso plus Atrazine	150# 18-46-0 160# Nitro	Chisel and Field Cultivator	Northrup-King 83	9/13/81	141	56
C2	04/07/81	Thimet	"	"	"	"	8/14/81	Silage	--
C3	04/08/81	Thimet	"	150# A.A 70# 7-21-7	Field Cultivator	"	9/12/81	152	57
C4	04/06/81	Thimet	Lasso plus Bladex	150# 18-46-0 160# Nitro	Chisel and Field Cultivator	Dekalb 74a	9/03/81	149	56
C5	04/11/81	Thimet	Lasso plus Atrazine	150# A.A	Disc	Northrup-King 83	9/20/81	161	56
C6	04/02/81	Thimet	Lasso plus Atrazine	150# 18-46-0 160# Nitro	Chisel and Field Cultivator	Cargill 967	9/12/81	144	56
C7	04/03/81	--	Sutan + Atrex	145-0-0	Disc, chisel + Field Cultivator	3183	9/15/81	137	NA

*Not available.

APPENDIX VI: Farm-Operator Reports for the 1981 Vegetation Experiment

Field	Planting Date	Festicide Used	Herbicide Used	Fertilizer Used No. # N, P, K	Field Preparation	Seed Variety	Harvest Date	Yield Bu/ Acre	Bu. Wt. Lbs.
C8	04/02/81	--	Ramrod and Atrex	155-46-30	Disc, ripped & Field Cultivator	3780	8/25/81	75	NA
C9	04/14/81	Counter	Lasso + Atrazine	18-46-30 145-0-0	Disc, chisel + Field Cultivator	Northrup-King 74	9/17/81	141	NA
C10	04/02/81	Thimet	Lasso and Atrazine	150# 18-46-0 160# Nitro	Chisel and Field Cultivator	Cargill 967	9/12/81	144	56
S1	05/15/81	--	Lasso plus Modown	150# 18-46-0	Chisel and Field Cultivator	Crawford	10/13/81	43	61
S2	05/14/81	--	"	--	Disc	Williams	10/20/81	49	59
S3	05/09/81	--	Treflan	--	Field Cultivator	Williams	10/09/81	52	61
S4	05/12/81	--	Treflan + Lexone	18-46-30	Plowed, disc + Field Cultivator	Union	10/07/81	47	NA
S5	05/01/81	--	Lasso + Sencor	150# 18-46-0	Chisel and Field Cultivator	Union	09/30/81	38	59
S6	06/24/81	--	Lasso, Lor-ox + Paraqt.	--	No till	Williams	10/21/81	44	NA
S7	NA	NA	NA	NA	NA	NA	NA	NA	NA
S8	07/02/81	--	--	--	No till	Williams	--	30	NA
S9	06/20/81	--	Lorox, Lasso + Paraquat	--	No till	Williams	10/23/81	37	NA
S10	07/02/81	--	--	--	No till	Williams	--	--	NA
S11	07/03/81	--	Lasso + Modown	--	Disc	Williams	10/21/81	44	60

APPENDIX VII

Physiological Growth Stage Codes Used in 1981 Vegetation Experiment*

*from Enumerator's Manual (NASA/JSC, 1981).

CROP GROWTH STAGES CODES

Barley, Oats, Wheat and Rye Crop Growth Stages

CODE	STAGE
	PLANT EMERGENCE AND TILLERING
10	Undetermined; plant emergence and tillering substage not detectable.
11	Emergence from soil, single shoot.
12	Primary leaf stage, from two-five leaves.
13	Early tillering, one-two tillers visible.
14	Full tillering, three or more tillers visible.
	VEGETATIVE GROWTH
20	Undetermined; vegetative growth substage not detectable.
21	First node of stem visible at base of shoot.
22	Second node on stem visible.
23	Last leaf visible, flag leaf, but still rolled as it emerges from last sheath.
24	Early to mid boot, leaf sheath swollen.
25	Mid to late boot, leaf sheath swollen, tip of head may be visible.
	HEADING AND FLOWERING
30	Undetermined; heading and flowering substage not detectable.
31	Early heading, heads just visible as they push out of split in sheath of flag leaf.
32	Heading complete, all of head emerged from sheath.
33	Flowering, stem fully elongated and yellow antlers visible on outside of heads.
34	Kernels formed, kernels visible in head but are very tender and watery.
	RIPENING AND SEED DEVELOPMENT
40	Undetermined; ripening and seed development substage not detectable.
41	Milk Stage, contents of kernels like heavy cream.
42	Soft Dough Stage, contents of kernel soft but becoming dry.
43	Hard Dough Stage, kernel may be dented with fingernail with difficulty.
	MATURITY
50	Undetermined; maturity substage not detectable.
51	Ripe for cutting, kernel at hard dough stage but straw not completely dead.
52	Ripe for cutting, kernel at hard dough stage and straw completely dead.
53	Post ripe stage, crop still standing, becoming darker in color.
	HARVEST
60	Undetermined; harvest substage not detectable.
61	Crop harvested by combine; straw and stubble on surface.
62	Crop harvested by combine; straw raked, stacked, baled, and removed from soil surface.
63	Crop windrowed or swathed, not yet threshed.
64	Crop windrowed or swathed, followed by threshing with combine, straw and stubble on soil surface.
65	Crop windrowed or swathed, followed by threshing with combine, straw raked, stacked, or baled and removed from soil surface.

Corn Growth Stages

CODE	STAGE
	PLANT EMERGENCE
10	Undetermined; plant emergence substage not detectable.
11	Plant emergence; tip of coleoptile visible above soil surface.
12	One or two leaves fully emerged from coleoptile.
	VEGETATIVE GROWTH
20	Undetermined; vegetative substage not detectable.
21	Three-four leaves emerged.
22	Five-eight leaves fully emerged.
23	Nine-twelve leaves fully emerged.
24	Thirteen-sixteen leaves fully emerged; lower four-five leaves perhaps lost leaving eight-nine functional leaves; tassel developed but still enclosed within whorl; brace roots from lower nodes are now developing.
25	Seventeen-twenty leaves fully emerged.
26	More than twenty leaves fully emerged.
	HEADING AND FLOWERING
30	Undetermined; heading and flowering substage not detectable.
31	Tips of tassels visible from whorl of leaves.
32	Tassels fully emerging; all leaves fully emerged; some silks starting to emerge from tip of husks.
33	Silks nearly fully emerged; pollen shedding.
	RIPENING AND SEED DEVELOPMENT
40	Undetermined; ripening and seed development substage not detectable.
41	Kernels in blister stage; cob, husks, and ear shank approaching full size; about twelve days after silking.
42	Soft dough or just past "roasting ear" stage; about twenty-four days after silking.
43	Beginning dent stage; a few kernels showing dents about thirty-six days after silking.
44	Full dent stage; all kernels fully dented but not dry; husks on ear and leaves starting to senesce.
	MATURITY
50	Undetermined; maturity substage not detectable.
51	Physiological maturity; about sixty days after silking; black layer formed at base of most kernels; some of remaining leaves still green.
52	Physiological maturity; black layer formed; leaves dried up and bright yellow.
53	Post maturity; crop still standing with leaves, stalks, and ear husks turning dark color.
	HARVEST
60	Undetermined; harvest substage not detectable.
61	Crop harvested green before full maturity for use as silage.
62	Crop harvested for grain with corn picker; ear only removed and plants still partially standing.
63	Crop harvested for grain with combine; plants reduced to stubble and residue.
64	Ear and entire plant removed; very little residue on soil surface.

Soybeans Growth Stages

CODE	STAGE
	PLANT EMERGENCE
10	Undetermined; plant emergence substage not detectable.
11	Cotyledons emerged above soil surface.
12	First true leaf; appearance of two unifoliate (single leaflet) leaves above cotyledons.
	VEGETATIVE GROWTH
20	Undetermined; vegetative growth substage not detectable.
21	Plant has two or less nodes. If two nodes are present, one is at the unifoliate leaves and the second at the first trifoliate leaf.
22	Plant has three-four nodes on the main stem, each with fully developed leaves. Node at unifoliate leaves is counted as No. 1.
23	Plant has five or more nodes on main stem. Vegetative stages can continue for several weeks before entering reproductive stage.
	HEADING AND FLOWERING
30	Undetermined; heading and flowering substage not detectable.
31	One open flower at any node on the main stem.
32	Full bloom; open flower at one of the two uppermost nodes on main stem.
	RIPENING AND SEED DEVELOPMENT
40	Undetermined; ripening and seed development substage not detectable.
41	Pod, 1/4 inch long, at one of the four uppermost nodes on main stem with fully developed leaf.
42	Full pod; pod one inch long at one of the four uppermost nodes on main stem with fully developed leaf.
43	Beginning seed; seed bean 1/8 inch long in a pod at one of the four uppermost nodes on the main stem.
44	Full seed stage; seed fills the pod cavity at one of the four uppermost nodes on the main stem, bottom leaves starting to turn yellow.
	MATURITY
50	Undetermined; maturity substage not detectable.
51	Physiological maturity; leaves on plant should range from green at the top of the plant to yellow and falling off at the bottom; one yellow or brown pod with seeds completely yellow, free of green color, on the main stem.
52	Harvest maturity; 95% of pods are brown, most leaves have fallen from plant.
	HARVEST
60	Undetermined; harvest substage not detectable.
61	Crop harvested with combine; stubble and plant residue sufficient to cover soil surface.
62	Harvested with combine; soil surface exposed with small amount of stubble and residue.

APPENDIX VIII

Particle Size-Classification of 0-5-cm Layer for
Summer 1981 Vegetation Experiment

Field No.	% Sand	% Silt	% Clay	Classification
1W	57.7	33.6	8.7	Sandy loam
2W	53.7	37.9	8.4	Sandy loam
3W	10.1	61.4	27.8	Silty clay loam
4W	26.0	54.7	19.3	Silty loam
5W	18.0	61.2	22.8	Silty loam
6W	13.2*	72.4	14.4	Silty loam
7W	11.4*	76.5	12.1	Silty loam
8W	32.0	53.1	14.9	Silty loam
9W	59.3	31.1	9.6	Sandy loam
10W	46.0	41.5	12.5	Loam
1C	35.9	51.9	12.2	Silty loam
2C	24.1*	51.1	24.8	Silty loam
3C	29.9	60.5	9.6	Silty loam
4C	40.6	44.3	15.1	Loam
5C	36.1	49.9	14.0	Loam
6C	31.5	52.4	16.1	Silty loam
7C	31.2	52.2	16.6	Silty loam
8C	30.4	40.9	28.7	Clayey loam
9C	56.6	29.9	13.5	Sandy loam
10C	39.7	44.2	16.1	Loam
1S	37.2	45.8	17.0	Loam
2S	60.9	29.5	9.6	Sandy loam
3S	32.4	56.0	11.6	Silty loam
4S				
5S	6.1*	68.3	25.6	Silty loam

*Defoamed

APPENDIX IX

Wet and Dry Biomass values for All Fields in 1981 Vegetation Experiment

Wheat Field # 1

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)
05/01/81	14:23	5	89.03	35.63			
05/04/81	13:40	5	115.70	36.86			
05/05/81	13:35	5	84.20	36.93			
05/08/81	13:08	5	117.76	44.76			
05/11/81	13:30	6	67.90	31.53	4	24.23	9.93
05/15/81	13:34	6	62.77	30.20	4	30.36	11.93
05/19/81	16:25	6	51.80	26.47	4	34.46	16.63
05/20/81	13:15	6	75.80	37.37	4	36.26	26.86
05/22/81	09:35	6	82.84	38.14	4	48.96	17.60
05/26/81	10:15	6	83.90	35.50	4	48.46	19.03
05/27/81	11:51	6	88.30	38.07	4	59.03	23.93
05/29/81	10:07	6	129.94	54.37	4	79.30	33.83
06/01/81	13:35	6	67.40	31.70	4	53.93	26.60
06/03/81	09:20	6	67.08	34.44	4	47.36	24.46
06/04/81	09:34	6	63.17	26.50	4	48.93	25.30
06/08/81	14:00	6	39.28	26.12	4	28.63	20.10
06/10/81	09:52	6	45.23	25.30	4	32.03	24.76
06/16/81	10:00	6	31.57	22.00	4	28.20	24.70
06/17/81	09:15	6	38.33	27.60	4	36.43	32.76
06/18/81	09:52	6	27.37	20.63	4	24.20	22.40
06/22/81	14:56	6	14.43	10.43			

Wheat Field # 2

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)
05/01/81	14:51	5	148.21	40.01			
05/04/81	13:40	5	98.03	26.56			
05/06/81	13:49	5	111.20	36.16			
05/08/81	13:12	5	158.86	49.83			
05/11/81	13:28	6	100.06	42.23	4	27.00	11.93
05/15/81	13:34	6	58.87	23.67	4	16.00	6.20
05/20/81	13:15	6	113.84	52.80	4	44.80	15.93
05/22/81	09:35	6	73.87	30.54	4	29.73	10.70
05/26/81	10:00	6	81.07	36.94	4	42.16	17.16
05/27/81	12:00	6	91.87	39.67	4	52.10	22.46
05/29/81	09:45	6	93.74	35.34	4	51.96	21.66
06/01/81	13:40	6	85.17	36.17	4	52.13	23.96
06/03/81	09:25	6	55.24	25.07	4	47.30	21.93
06/04/81	09:40	6	54.21	25.68	4	35.23	17.33
06/08/81	13:53	6	81.84	37.31	4	76.83	42.46
06/10/81	09:52	6	62.67	29.83	4	55.16	36.56
06/16/81	10:32	6	41.17	25.47	4	35.10	29.63
06/17/81	09:20	6	28.67	16.87	4	32.20	28.56
06/18/81	09:55	6	22.63	13.50	4	20.53	18.63
06/22/81	15:00	6	16.37	11.67			
06/26/81	15:00	6	15 80	13.50			
06/29/81	14:22	6	11.10	10.57			
07/14/81	09:45	5	16.32	14.92			

Wheat Field # 3

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)
05/01/81	14:38	5	267.68	56.85			
05/04/81	14:27	5	407.36	75.06			
05/06/81	13:40	5	240.28	55.35			
05/08/81	13:35	5	253.03	55.56			
05/11/81	13:35	6	201.03	48.93	4	27.53	8.06
05/15/81	13:42	6	246.24	75.97	4	36.43	12.73
05/19/81	16:25	6	285.14	84.34	4	45.70	14.80
05/20/81	14:15	6	181.57	65.80	4	34.60	14.13
05/22/81	09:55	6	208.27	59.20	4	43.00	14.20
05/26/81	11:15	6	300.30	96.54	4	75.56	25.60
05/27/81	11:20	6	304.20	94.07	4	74.56	24.40
05/29/81	10:15	6	158.27	48.74	4	55.36	21.00
06/01/81	14:30	6	140.34	53.34	4	51.20	18.50
06/03/81	10:50	6	200.31	71.18	4	72.40	31.13
06/04/81	10:06	6	183.37	57.93	4	72.76	33.30
06/08/81	14:35	6	121.47	48.27	4	62.53	31.20
06/10/81	10:25	6	110.37	43.57	4	63.86	35.33
06/16/81	10:30	6	102.73	45.47	4	51.93	34.70
06/17/81	09:56	6	73.80	38.17	4	40.00	33.06
06/18/81	10:26	6	70.13	40.37	4	39.46	34.00
06/22/81	14:30	6	132.50	50.73	4	44.26	35.63
06/24/81	10:00	6	78.17	53.97	4	42.56	39.53
06/26/81	14:57	6	57.40	36.53	4	32.96	30.90
06/29/81	14:52	6	11.97	8.87			
07/14/81	10:10	5	43.22	36.82			

Wheat Field # 4

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)
05/01/81	15:16	5	233.21	66.38			
05/04/81	14:45	5	203.36	39.33			
05/06/81	14:32	5	244.83	54.96			
05/08/81	13:46	5	245.26	56.66			
05/11/81	14:06	6	189.06	63.10	4	25.00	7.73
05/15/81	14:00	6	225.90	61.84	4	30.13	11.40
05/20/81	14:20	6	196.54	67.97	4	33.86	13.43
05/22/81	10:00	6	195.64	57.27	4	34.10	10.83
05/26/81	14:03	6	200.57	69.17	4	51.30	18.63
05/27/81	11:15	6	163.74	53.44	4	48.10	17.16
05/29/81	11:18	6	244.34	65.60	4	56.46	17.13
06/01/81	14:35	6	139.34	50.34	4	48.46	20.33
06/03/81	11:22	6	168.20	55.97	4	64.30	28.23
06/04/81	11:25	6	183.78	64.71	4	67.93	32.03
06/08/81	13:20	6	98.81	40.54	4	49.76	27.30
06/10/81	10:21	6	158.50	61.90	4	58.40	28.30
06/17/81	11:40	6	100.03	45.90	4	54.36	43.23
06/18/81	10:37	6	80.30	40.50	4	42.36	36.73
06/29/81	14:45	6	50.50	43.27	4	28.40	27.50
07/02/81	99:99	6	35.57	29.93	4	26.40	24.43
07/14/81	10:05	5	13.82	12.32			
07/15/81	09:27	5	21.02	20.12			

Wheat Field # 5

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)
05/01/81	15:32	5	207.86	60.76			
05/06/81	14:37	5	184.95	44.15			
05/08/81	14:08	5	325.43	75.03			
05/11/81	14:21	6	338.30	90.07	4	26.06	6.86
05/15/81	14:52	6	245.77	67.37	4	22.46	6.33
05/20/81	15:20	6	224.04	71.24	4	23.16	8.06
05/22/81	10:34	6	220.04	62.37	4	26.13	7.76
05/27/81	11:40	6	167.14	51.67	4	31.30	10.13
05/28/81	09:29	6	247.44	68.57	4	38.00	11.20
05/29/81	13:55	6	294.70	83.64	4	45.56	14.23
06/01/81	15:00	6	239.90	86.04	4	61.96	24.16
06/03/81	14:11	6	200.54	57.97	4	48.80	17.83
06/04/81	11:17	6	154.81	57.14	4	48.93	20.80
06/08/81	13:25	6	140.51	51.37	4	51.50	25.33
06/10/81	11:06	6	104.67	38.23	4	36.53	19.30
06/16/81	15:35	6	92.70	42.00	4	43.46	27.73
06/17/81	11:38	6	93.60	49.23	4	48.46	33.86
06/18/81	11:21	6	145.27	67.00	4	60.46	41.53
06/24/81	16:19	6	93.40	61.50	4	43.60	40.83
06/29/81	15:30	6	84.57	59.17	4	29.93	29.20
07/02/81	14:15	6	42.47	37.13	4	30.30	28.83

Wheat Field # 6

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)
05/01/81	16:02	5	145.67	53.64			
05/06/81	14:54	5	161.93	52.16			
05/08/81	14:11	5	184.30	61.40			
05/11/81	14:39	6	132.76	58.80	4	32.66	12.20
05/15/81	14:35	6	164.70	58.87	4	53.56	21.70
05/20/81	14:45	6	133.04	61.87	4	49.30	16.10
05/22/81	13:27	6	98.50	40.04	4	49.43	17.96
05/26/81	14:35	6	118.90	49.00	4	69.26	29.53
05/27/81	10:52	6	117.44	48.04	4	65.06	27.63
05/29/81	15:24	6	165.37	60.87	4	77.86	34.06
06/01/81	15:13	6	85.57	36.97	4	57.76	28.26
06/03/81	15:40	6	81.40	36.04	4	60.83	31.86
06/05/81	10:30	6	114.04	49.71	4	91.40	47.80
06/08/81	14:35	6	73.15	35.42	4	62.66	41.13
06/10/81	10:54	6	52.17	23.17	4	41.90	29.86
06/12/81	10:44	6	78.80	34.97	4	57.70	38.20
06/15/81	15:05	6	80.80	31.60	4	55.13	40.83
06/17/81	10:05	6	49.13	25.07	4	39.70	34.80
06/19/81	14:53	6	42.90	29.60	4	39.10	35.26
06/22/81	15:30	6	37.17	23.57	4	34.33	28.83
06/24/81	14:10	6	31.10	24.10	4	28.33	24.96
06/26/81	11:05	6	53.63	41.30	4	47.96	45.53
06/29/81	15:34	6	13.50	12.60			
07/14/81	10:25	5	29.52	25.52			
07/15/81	10:06	5	28.32	27.32			

Wheat Field # 7

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)
05/01/81	16:23	5	187.50	60.93			
05/06/81	15:25	5	231.88	89.05			
05/08/81	14:43	5	453.46	148.03			
05/11/81	15:46	6	205.86	85.76	4	41.30	14.93
05/15/81	99:99	6	192.54	77.60	4	48.36	19.23
05/20/81	16:20	6	181.24	82.27	4	60.56	22.20
05/22/81	15:20	6	140.80	58.70	4	50.06	20.33
05/27/81	10:10	6	170.50	72.27	4	77.80	32.10
05/29/81	14:53	6	125.54	52.70	4	65.63	29.46
06/01/81	16:10	6	121.40	53.84	4	80.20	42.00
06/03/81	15:41	6	92.40	42.60	4	50.50	27.76
06/05/81	11:03	6	128.32	59.45	4	82.70	47.86
06/08/81	15:40	6	116.13	58.96	4	77.80	47.16
06/10/81	12:32	6	106.82	52.52	4	57.40	41.00
06/12/81	11:28	6	96.55	46.42	4	55.40	39.56
06/16/81	14:30	6	80.12	48.59	4	58.46	51.36
06/17/81	10:53	6	78.99	43.55	4	42.36	38.36
06/19/81	14:45	6	33.82	22.42	4	27.10	24.46
06/24/81	14:50	6	33.05	27.42			
06/26/81	11:20	6	23.15	16.69			
07/15/81	10:30	5	19.42	15.42			

Wheat Field # 8

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)
05/01/81	16:51	5	164.82	57.59			
05/06/81	15:24	5	230.08	60.03			
05/08/81	14:45	5	302.36	76.73			
05/11/81	15.36	6	148.70	59.66	4	22.66	6.93
05/15/81	15:05	6	111.20	43.77	4	35.06	15.03
05/20/81	15:15	6	238.64	87.10	4	49.93	16.46
05/22/81	15:18	6	118.60	46.97	4	37.96	15.43
05/28/81	10:05	6	152.87	57.14	4	63.40	24.33
05/29/81	15:45	6	77.97	38.44	4	56.56	24.36
06/01/81	15:55	6	121.24	50.70	4	68.03	32.06
06/03/81	15:05	6	69.64	31.34	4	53.26	28.16
06/05/81	11:40	6	102.19	42.92	4	66.73	35.76
06/08/81	15:25	6	83.93	38.43	4	63.20	37.53
06/10/81	11:36	6	58.22	29.05	4	48.63	34.86
06/12/81	11:22	6	73.39	34.65	4	54.80	36.46
06/15/81	15:36	6	83.12	40.82	4	47.33	34.43
06/17/81	10:40	6	65.72	36.89	4	46.86	40.60
06/19/81	15:29	6	45.75	32.09	4	39.70	35.96
06/22/81	16:05	6	74.95	42.69	4	41.80	34.03
06/24/81	15:55	6	51.05	42.05	4	40.63	38.16
06/26/81	11:40	6	36.42	33.02	4	37.20	35.20
06/29/81	16:07	6	31.55	28.92	4	30.80	28.66
07/02/81	15:12	6	41.82	39.92	4	39.73	38.03
07/15/81	10:35	5	12.12	10.62			

Wheat Field # 9

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)
05/01/81	17:00	5	91.66	36.66			
05/06/81	16:11	5	127.35	46.75			
05/08/81	15:00	5	138.01	47.08			
05/11/81	15:05	6	103.10	53.00	4	19.86	7.60
05/15/81	15:25	6	144.30	53.27	4	37.30	13.86
05/19/81	15:50	6	127.87	58.97	4	61.90	25.23
05/20/81	15:40	6	60.50	27.34	4	28.96	11.63
05/22/81	13:30	6	77.67	35.37	4	37.83	14.00
05/28/81	10:07	6	100.67	40.84	4	61.40	25.23
05/29/81	14:27	6	71.97	37.84	4	47.36	18.20
06/01/81	15:35	6	54.67	23.77	4	29.63	14.28
06/03/81	15:10	6	65.44	27.24	4	43.26	22.33
06/05/81	09:55	6	46.85	20.02	4	41.86	22.93
06/08/81	15:10	6	58.70	24.06	4	48.53	32.50
06/10/81	11:54	6	50.95	22.62	4	38.23	29.16
06/12/81	10:45	6	60.89	27.79	4	39.50	28.86
06/15/81	15:08	6	53.22	26.22	4	44.73	32.12
06/17/81	10:25	6	40.55	26.49	4	37.60	33.33
06/19/81	15:55	6	14.22	10.52			
06/22/81	15:33	6	15.45	11.45			
07/15/81	09:54	5	12.22	10.72			

Wheat Field # 10

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)
05/01/81	17:29	5	23.79	10.25			
05/06/81	16:04	5	63.70	18.13			
05/08/81	15:30	5	31.42	9.85			
05/11/81	16:11	5	35.27	9.80			
05/15/81	16:15	5	125.37	46.77			
05/20/81	16:00	5	123.87	33.90			
05/22/81	15:52	5	96.97	27.14			
05/28/81	10:43	6	57.97	14.70	4	7.13	1.76
05/29/81	15:24	6	74.74	25.84	4	17.66	6.23
06/01/81	16:25	6	70.07	24.37	4	17.00	5.93
06/03/81	16:10	6	79.67	29.34	4	21.86	7.86
06/05/81	12:08	6	56.65	19.29	4	21.66	6.50
06/08/81	15:55	6	57.10	25.66	4	21.00	9.46
06/10/81	12:13	6	50.99	22.12	4	31.30	14.56
06/12/81	12:05	6	47.35	19.49	4	23.90	10.46
06/15/81	15:30	6	58.72	25.02	4	26.73	11.33
06/17/81	11:20	6	22.59	12.59	4	15.86	10.40
06/19/81	15:25	6	20.42	11.99	4	13.76	8.13
06/22/81	16:30	6	16.29	13.62	4	11.70	9.80
06/24/81	15:15	6	18.99	16.39	4	15.96	11.76
06/26/81	11:45	6	20.35	16.79	4	10.73	10.16
06/29/81	16:00	6	14.12	8.99			
07/15/81	11:00	5	8.02	5.52			

Corn Field # 1

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)
05/19/81	15:00	5	126.70	30.30						
05/21/81	10:10	5	144.87	26.47						
05/26/81	12:03	5	277.34	32.94						
05/27/81	14:02	5	203.04	26.84						
05/29/81	09:44	5	246.27	27.10						
06/03/81	10:05	5	337.90	33.07						
06/04/81	14:00	5	369.17	35.10						
06/05/81	14:02	5	235.04	25.14						
06/09/81	09:35	5	348.55	33.99						
06/12/81	14:16	5	584.82	49.45						
06/16/81	09:44	5	787.67	56.97						
06/18/81	14:15	5	925.62	88.72						
06/19/81	09:50	5	938.42	71.65						
06/24/81	09:35	6	933.22	114.02	4	18.39	4.39			
06/25/81	13:50	1	220.34	64.59	2	745.84	112.79	9	180.99	39.89
07/02/81	10:00	1	245.19	67.46	8	481.02	110.79	3	287.09	46.46
07/13/81	14:06	1	252.42	65.89	3	519.85	115.82	8	636.19	127.39
07/15/81	13:30	1	153.62	40.85	3	419.27	101.82	8	468.19	94.15
07/17/81	09:35	1	196.22	49.62	3	455.05	108.62	8	510.82	105.82
07/20/81	14:05	1	174.22	46.99	3	381.39	117.42	8	522.52	101.82
07/21/81	14:15	1	218.89	49.29	3	380.72	35.89	8	392.22	63.62
07/23/81	09:55	1	185.69	44.22	3	427.12	34.79	8	523.92	86.02
07/28/81	14:35	1	151.39	39.29	3	495.72	168.92	8	451.95	98.52
07/29/81	09:58	1	209.69	53.95	3	517.79	173.22	8	513.89	91.62
07/30/81	10:00	1	185.35	53.62	3	437.39	116.95	8	498.95	86.49
08/04/81	09:55	1	213.55	59.19	3	459.29	224.92	8	492.49	87.19
08/06/81	11:45	1	183.79	56.09	3	632.02	195.42	8	545.39	105.72
08/10/81	99:99	1	140.92	51.39	3	397.22	266.85	8	379.32	76.29
08/12/81	11:15	1	99.59	49.52	3	441.49	316.95	8	426.69	82.72
08/13/81	10:23	1	124.35	50.52	3	465.89	297.52	8	535.72	102.89
08/24/81	15:23	1	61.42	44.67	3	335.47	244.57	8	370.37	108.72
08/28/81	14:13	1	50.97	45.22	3	352.82	274.92	8	285.97	77.17
08/30/81	13:25	1	33.32	33.82	3	300.82	229.97	8	293.37	79.82
09/01/81	99:99	1	31.82	30.92	3	325.92	18.82	8	469.22	137.72
09/03/81	14:30	1	37.02	35.97	3	336.02	204.27	8	404.12	139.72
09/06/81	12:14	1	39.02	37.32	3	0.	0.	8	213.17	88.37
09/08/81	14:38	1	53.02	52.82	3	271.57	208.92	8	237.92	90.57

Corn Field # 2

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)
05/19/81	14:25	5	125.70	27.04						
05/21/81	10:27	5	194.77	36.67						
05/26/81	10:45	5	335.14	33.27						
05/27/81	14:22	5	348.60	42.40						
05/29/81	10:34	5	339.57	28.30						
06/03/81	10:00	5	394.24	34.97						
06/04/81	14:18	5	382.77	37.60						
06/05/81	14:25	5	399.84	35.27						
06/09/81	10:00	5	480.92	65.82						
06/12/81	14:34	5	875.22	96.59						
06/16/81	10:03	5	855.66	72.59						
06/19/81	10:15	5	1007.79	95.79						
06/24/81	10:01	5	1094.41	142.34	4	31.02	8.19			
06/25/81	14:10	1	232.59	54.55	2	724.09	90.89	9	189.52	21.22
07/02/81	10:30	1	223.99	47.55	3	250.72	89.39	8	597.42	28.19
07/13/81	99:99	1	250.39	61.19	3	422.02	89.05	8	784.89	131.65
07/15/81	13:52	1	186.12	48.22	3	520.02	158.72	8	488.55	94.05
07/16/81	13:41	1	318.52	79.95	3	409.82	86.75	8	516.55	103.69
07/20/81	15:00	1	183.95	50.55	3	322.69	92.72	8	354.02	68.82
07/22/81	10:02	1	189.09	44.65	3	364.72	113.19	8	654.39	112.39
07/23/81	10:15	1	203.42	45.89	3	531.32	101.47	8	550.29	91.89
07/28/81	15:19	1	196.72	45.85	3	445.09	197.29	8	700.22	112.29
07/29/81	10:19	1	183.79	52.55	3	418.02	196.95	8	590.22	94.95
07/30/81	10:28	1	279.02	58.27	3	412.59	120.09	8	714.95	143.09
08/04/81	09:58	1	207.32	53.65	3	404.19	115.59	8	591.05	96.29
08/11/81	09:45	1	191.35	49.89	3	435.49	263.99	8	549.02	59.57
08/12/81	11:45	0	95.79	13.69						

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Corn Field # 3

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)
05/19/81	14:30	5	80.00	17.67						
05/21/81	10:35	5	98.34	18.27						
05/26/81	11:40	5	191.54	24.44						
05/27/81	14:13	5	180.60	22.84						
05/29/81	10:50	5	170.84	20.50						
06/03/81	11:22	5	283.80	29.40						
06/04/81	14:30	5	363.74	35.10						
06/05/81	14:57	5	181.24	19.04						
06/09/81	09:52	5	387.35	34.52						
06/12/81	14:35	5	579.62	53.32						
06/16/81	11:04	5	810.72	56.17						
06/18/81	14:32	5	802.19	65.99						
06/19/81	10:03	5	874.09	78.72						
06/24/81	10:50	5	956.32	99.55						
06/25/81	13:57	5	932.79	110.29						
07/02/81	10:48	1	238.19	47.15	8	800.12	100.42	3	333.22	32.99
07/13/81	14:35	1	229.15	55.69	3	482.35	96.62	8	742.42	131.05
07/15/81	13:45	1	227.15	54.95	3	448.69	113.02	8	635.02	88.05
07/16/81	14:30	1	290.67	60.77	3	468.29	74.25	8	654.79	116.72
07/20/81	15:26	1	250.65	60.15	3	509.72	134.89	8	552.62	91.22
07/22/81	10:45	1	251.72	52.09	3	447.32	78.65	8	560.62	91.22
07/23/81	10:45	1	323.65	66.12	3	345.17	41.07	8	627.55	93.22
07/28/81	15:56	1	217.09	49.82	3	510.69	180.65	8	638.59	108.22
07/29/81	11:20	1	278.19	63.45	3	579.42	193.29	8	655.12	99.27
07/30/81	10:56	1	266.57	58.12	3	557.85	200.55	8	649.95	104.69
08/04/81	10:18	1	227.65	53.82	3	538.57	189.02	8	532.15	86.99
08/05/81	14:03	1	306.62	70.35	3	563.72	254.02	8	673.32	104.89
08/11/81	10:05	1	246.89	55.29	3	460.99	262.52	8	577.85	97.15
08/13/81	11:10	1	228.25	50.15	3	500.69	275.29	8	664.02	113.75
08/24/81	14:45	1	86.77	51.27	3	417.97	273.37	8	415.97	92.32
08/28/81	15:33	1	80.42	67.12	3	407.72	210.22	8	392.02	106.82
08/30/81	13:55	1	61.67	57.52	3	374.82	272.57	8	427.77	85.72
09/01/81	15:12	1	72.77	54.77	3	382.72	291.27	8	611.22	133.57
09/03/81	15:32	1	50.72	45.42	3	333.37	125.27	8	443.07	114.87
09/06/81	12:20	0	406.87	111.57						

Corn Field # 4

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)
05/19/81	14:45	5	184.44	48.07						
05/21/81	10:46	5	229.17	35.00						
05/26/81	11:34	5	386.64	47.87						
05/27/81	14:45	5	361.67	43.77						
05/29/81	10:56	5	436.90	47.70						
06/03/81	10:35	5	494.70	43.20						
06/04/81	14:52	5	646.04	53.40						
06/05/81	14:45	5	456.40	38.14						
06/09/81	10:25	5	655.99	61.79						
06/12/81	15:05	5	871.35	83.12						
06/16/81	99:99	5	1009.62	75.32						
06/18/81	15:00	5	959.07	93.47						
06/19/81	10:42	5	887.22	89.42						
06/24/81	10:37	6	949.09	114.65	4	22.69	6.42			
06/25/81	14:40	1	274.54	71.74	2	597.24	87.49	9	138.49	37.14
07/02/81	11:30	1	248.02	66.52	8	615.56	103.32	3	216.76	39.99
07/13/81	14:45	1	256.42	62.82	3	372.72	93.42	8	499.29	88.22
07/15/81	14:15	1	237.35	64.72	3	466.89	81.92	8	559.89	113.75
07/16/81	14:10	1	265.39	61.95	3	427.22	112.22	8	541.82	115.45
07/20/81	99:99	1	261.69	63.92	3	459.85	147.35	8	515.15	100.19
07/22/81	11:10	1	282.09	60.49	3	418.12	58.97	8	484.09	84.79
07/23/81	10:43	1	195.32	45.42	3	443.67	30.02	8	598.82	98.72
07/28/81	15:25	1	197.59	48.29	3	394.52	174.92	8	510.79	102.09
07/29/81	10:35	1	265.42	61.52	3	478.42	222.42	8	577.82	116.69
07/30/81	11:05	1	218.12	47.22	3	371.22	162.12	8	518.02	87.99
08/04/81	10:23	1	229.85	57.49	3	477.02	204.45	8	540.79	110.22
08/05/81	14:00	1	223.05	63.02	3	431.65	123.05	8	440.29	83.09
08/07/81	10:05	1	204.22	49.45	3	256.32	116.52	8	363.65	76.55
08/11/81	10:50	1	174.95	45.12	3	395.42	232.59	8	423.89	87.35
08/13/81	11:15	1	268.39	65.15	3	452.85	257.79	8	513.85	107.79

Corn Field # 5

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)
05/19/81	14:43	5	135.50	32.50						
05/21/81	10:55	5	188.44	31.04						
05/26/81	11:50	5	361.24	42.87						
05/27/81	14:35	5	248.17	35.20						
05/29/81	11:10	5	311.44	33.70						
06/03/81	11:44	5	509.00	47.80						
06/04/81	14:50	5	702.40	58.44						
06/05/81	15:20	5	319.14	31.30						
06/09/81	10:15	5	478.26	61.46						
06/12/81	15:00	5	685.46	84.22						
06/16/81	11:37	5	885.06	85.86						
06/18/81	14:56	5	967.82	100.69						
06/19/81	10:38	5	940.59	92.76						
06/24/81	11:15	6	1062.01	132.71	4	21.34	6.54			
06/25/81	14:37	1	186.87	38.27	2	497.22	64.07	9	76.77	10.07
07/02/81	11:46	1	253.72	52.02	8	653.85	103.09	3	329.52	35.89
07/13/81	14:55	1	249.49	66.12	3	588.85	136.02	8	827.75	139.49
07/15/81	14:10	1	181.75	48.85	3	383.95	86.79	8	551.99	105.72
07/16/81	14:22	1	207.69	52.85	3	408.65	96.42	8	563.22	106.22
07/20/81	15:20	1	286.59	76.89	3	465.89	166.15	8	546.52	95.92
07/22/81	11:12	1	208.99	53.15	3	558.55	138.12	8	604.72	103.65
07/23/81	11:15	1	205.89	48.82	3	598.52	84.05	8	635.79	109.55
07/28/81	16:27	1	237.82	58.49	3	493.62	135.92	8	593.02	108.55
07/29/81	11:25	1	251.75	58.49	3	582.09	227.25	8	599.82	105.55
07/30/81	11:21	1	257.89	59.82	3	524.25	137.02	8	607.15	105.52
08/04/81	10:45	1	207.12	56.85	3	405.32	150.77	8	556.85	103.62
08/05/81	14:31	1	225.39	62.72	3	460.49	216.55	8	578.32	96.99
08/07/81	10:43	1	272.12	62.52	3	522.85	221.52	8	665.49	112.82
08/11/81	10:40	1	153.32	39.45	3	339.12	191.07	8	437.65	97.49
08/13/81	11:37	1	237.89	58.82	3	446.49	222.29	8	592.25	120.19
08/28/81	16:24	1	44.17	39.02	3	306.92	153.67	8	415.22	2.72
08/30/81	14:25	1	75.67	73,27	3	355.52	273.32	8	458.12	108.92
09/01/81	15:22	1	69.82	57.62	3	277.17	215.07	8	408.92	113.77
09/03/81	15:55	5	222.12	68.17						

Corn Field # 6

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)
05/19/81	15:15	5	185.14	40.10						
05/22/81	10:40	5	223.90	29.74						
05/27/81	15:20	5	363.54	42.00						
05/29/81	11:27	5	307.74	31.24						
06/03/81	11:40	5	549.80	45.47						
06/04/81	15:15	5	876.17	71.74						
06/05/81	13:10	5	388.27	39.30						
06/09/81	10:52	5	690.12	59.55						
06/12/81	15:21	5	884.15	74.85						
06/15/81	16:00	5	1090.52	75.72						
06/16/81	15:50	5	904.75	68.29						
06/18/81	15:45	5	863.89	64.55						
06/19/81	11:02	5	1039.22	99.25						
06/24/81	11:25	6	1097.12	124.52	4	16.89	4.56			
06/25/81	15:25	5	1413.37	169.42						
06/26/81	14:35	1	318.22	52.97	2	913.57	90.42	9	92.77	7.47
07/10/81	99:99	1	280.05	62.75	8	662.35	110.25	3	547.42	68.45
07/13/81	10:42	1	281.05	64.92	3	664.69	107.49	8	730.72	129.19
07/16/81	10:57	1	287.79	67.59	3	655.95	126.25	8	725.45	139.32
07/17/81	10:45	1	285.22	61.82	3	529.19	132.69	8	753.27	136.82
07/21/81	11:00	1	279.22	60.35	3	578.69	97.92	8	659.05	107.95
07/22/81	12:08	1	253.32	71.89	3	552.62	96.55	8	666.82	110.49
07/23/81	14:55	1	226.19	56.15	3	432.52	83.52	8	590.52	100.09
07/28/81	11:35	1	275.79	61.32	3	678.22	223.42	8	704.25	114.12
07/29/81	15:30	1	213.75	54.62	3	567.57	205.32	8	577.82	104.55
07/30/81	15:17	1	233.19	55.09	3	500.09	97.72	8	538.92	109.99
08/04/81	10:50	1	216.22	58.39	3	585.05	206.45	8	649.92	113.12
08/05/81	15:25	1	233.45	67.55	3	535.47	193.87	8	656.72	108.99
08/10/81	15:35	1	185.72	51.97	3	476.45	281.42	8	519.99	96.09
08/11/81	14:05	1	218.32	60.52	3	598.95	312.95	8	636.92	114.79
08/14/81	11.10	1	204.75	54.92	3	487.42	253.22	8	616.12	142.99
08/26/81	15:53	1	116.32	74.52	3	498.77	325.97	8	682.02	158.52
08/30/81	12:25	1	78.32	54.97	3	436.22	316.82	8	587.32	209.37
09/02/81	15:30	1	78.02	63.82	3	382.42	281.27	8	543.82	137.17
09/04/81	15:30	1	54.72	47.57	3	338.37	267.07	8	457.42	124.97
09/06/81	14:20	1	65.37	53.12	3	406.22	71.12	8	531.42	154.47
09/09/81	15:10	1	58.92	61.62	3	0.	0.	8	456.07	119.97
09/13/81	14:25	1	52.82	52.62	3	407.72	82.62	8	352.02	149.92
09/15/81	15:26	1	0.	0.	3	0.	0.	8	290.22	132.72

Corn Field # 7

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)
05/20/81	10:35	5	46.67	9.70						
05/22/81	11:17	5	76.67	10.80						
05/27/81	15:20	5	143.47	18.27						
05/29/81	14:20	5	136.57	17.20						
06/03/81	14:33	5	240.97	26.87						
06/04/81	10:05	5	155.40	16.87						
06/05/81	13:40	5	133.27	16.20						
06/09/81	16:19	5	225.85	27.45						
06/12/81	09:55	5	324.65	32.92						
06/15/81	14:38	5	487.82	50.32						
06/16/81	14:11	5	383.27	39.12						
06/18/81	11:20	5	681.42	60.42						
06/24/81	14:08	5	762.19	90.95						
06/25/81	10:30	5	719.82	83.55						
07/13/81	15:15	1	196.25	51.19	3	416.49	70.35	8	472.49	96.09
07/16/81	09:55	1	277.72	64.22	3	471.32	91.65	8	395.62	84.12
07/17/81	09:35	1	199.82	55.15	3	404.55	87.95	8	490.92	105.79
07/21/81	10:00	1	360.79	78.89	3	446.07	107.12	8	423.89	77.49
07/22/81	14:40	1	221.09	59.12	3	287.25	39.52	8	346.89	71.12
07/23/81	14:02	1	202.22	50.89	3	526.22	134.95	8	476.65	80.69
07/28/81	10:06	1	221.75	54.45	3	489.79	114.65	8	474.39	101.12
07/29/81	13:55	1	126.25	36.35	3	314.12	111.49	8	247.92	45.35
07/30/81	14:03	1	202.05	50.12	3	434.32	50.19	8	359.72	78.87
08/04/81	14:55	1	235.22	71.72	3	544.52	204.39	8	442.32	79.05
08/05/81	14:56	1	131.92	58.45	3	476.59	183.42	8	301.19	81.32
08/07/81	15:50	1	184.89	56.79	3	395.67	101.67	8	328.15	67.59
08/10/81	14:25	1	163.02	59.15	3	324.82	174.02	8	371.65	70.35
08/11/81	14:35	1	99.39	32.49	3	288.22	131.62	8	300.49	70.79
08/26/81	14:00	1	140.42	58.37	3	306.17	195.67	8	314.17	69.97
08/30/81	11:30	1	71.37	42.07	3	248.77	161.52	8	249.67	71.07
09/02/81	14:11	1	72.62	57.92	3	342.32	239.12	8	367.42	83.22
09/04/81	14:50	1	61.22	42.52	3	301.37	210.47	8	380.12	110.92
09/06/81	12:45	1	58.22	45.17	3	362.67	230.22	8	431.72	109.22
09/09/81	15:37	1	38.02	37.42	3	0.	0.	8	396.62	114.42
09/13/81	15:30	1	42.37	42.22	3	0.	0.	8	232.27	88.92

Corn Field # 8

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)
05/20/81	10:30	5	73.97	15.70						
05/22/81	11:15	5	116.60	15.40						
05/28/81	09:21	5	154.67	18.67						
05/29/81	13:53	5	187.97	22.37						
06/04/81	10:37	5	239.04	26.14						
06/05/81	09:35	5	154.27	18.54						
06/09/81	16:21	5	273.15	35.79						
06/12/81	99:99	5	441.82	49.45						
06/15/81	14:35	5	491.22	59.62						
06/16/81	14:10	5	496.35	65.52						
06/18/81	11:00	5	423.07	48.72						
06/19/81	13:55	5	470.59	67.55						
06/24/81	13:40	6	535.55	87.95	4	10.42	3.69			
06/25/81	10:30	1	170.79	39.95	2	392.79	57.32	9	294.75	32.19
07/13/81	15:24	1	152.22	42.52	3	514.72	132.02	8	335.52	69.45
07/16/81	09:57	1	152.32	40.92	3	370.62	65.89	8	254.39	94.22
07/17/81	10:20	1	157.22	43.02	3	482.39	131.79	8	290.32	67.79
07/21/81	10:10	1	136.62	41.59	3	561.55	65.82	8	379.65	65.69
07/22/81	14:46	1	209.55	54.39	3	520.19	144.85	8	233.37	46.97
07/23/81	99:99	1	121.92	33.62	3	436.25	96.62	8	266.82	50.25
07/28/81	10:05	1	161.25	57.29	3	503.25	214.02	8	396.62	72.82
07/29/81	14:00	1	132.02	41.15	3	440.72	196.12	8	295.32	65.99
07/30/81	14:10	1	125.12	35.05	3	420.22	58.79	8	230.95	52.62
08/04/81	14:55	1	139.12	48.32	3	436.72	160.29	8	248.12	57.32
08/05/81	14:54	1	218.55	42.79	3	461.25	261.42	8	379.19	64.65
08/10/81	14:15	1	104.35	38.62	3	334.65	212.89	8	209.55	41.65
08/11/81	14:30	1	62.45	29.05	3	311.62	205.32	8	244.12	63.82
08/26/81	14:14	5	96.77	30.97						

Corn Field # 9

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)
05/20/81	11:10	5	52.47	12.17						
05/22/81	16:20	5	82.97	11.94						
05/28/81	10:41	5	160.07	18.20						
05/29/81	14:55	5	199.57	21.20						
06/04/81	10:35	5	171.77	20.27						
06/05/81	10:10	5	170.54	17.20						
06/10/81	12:37	5	377.22	36.29						
06/12/81	12:02	5	490.95	43.99						
06/16/81	14:55	5	590.35	52.69						
06/19/81	16:02	5	819.62	81.62						
06/24/81	14:45	5	883.52	93.02						
06/25/81	11:00	5	832.92	91.39						
06/26/81	11:05	5	966.72	102.65						
07/13/81	10:44	1	203.09	45.99	3	376.59	68.75	8	664.29	111.69
07/16/81	10:35	1	254.82	57.52	3	502.82	86.37	8	589.85	107.65
07/17/81	10:25	1	238.95	59.72	3	486.49	96.95	8	697.22	125.55
07/21/81	10:35	1	298.99	65.55	3	550.62	46.25	8	636.75	100.55
07/22/81	16:00	1	317.62	69.32	3	496.65	68.05	8	486.99	76.42
07/24/81	10:10	1	232.79	51.99	3	537.35	144.15	8	718.09	110.22
07/28/81	10:35	1	217.02	52.17	3	495.72	108.82	8	658.12	100.69
07/29/81	14:25	1	200.49	49.32	3	452.42	141.19	8	582.22	99.52
07/31/81	10:00	1	211.22	50.75	3	526.69	147.35	8	652.92	99.89
08/04/81	15:20	1	215.59	59.05	3	461.32	85.35	8	520.75	80.32
08/05/81	15:23	1	221.69	55.55	3	576.37	151.22	8	583.12	95.85
08/10/81	15:02	1	193.22	51.82	3	405.92	231.79	8	482.12	84.12
08/11/81	15:00	1	114.22	40.79	3	347.39	183.12	8	396.65	83.75
08/26/81	15:27	1	101.97	59.52	3	407.17	177.02	8	514.77	112.27
08/30/81	12:20	1	54.82	46.22	3	363.97	274.22	8	307.92	91.17
09/01/81	15:15	1	62.27	56.22	3	395.52	281.52	8	451.02	104.02
09/03/81	15:02	1	48.72	46.87	3	347.72	261.72	8	417.67	110.82
09/06/81	12:46	1	102.27	50.92	3	324.52	259.12	8	435.02	132.22
09/10/81	14:04	5	77.37	41.77						

Corn Field # 10

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)	Part Code	Wet Wt(g)	Dry Wt(g)
05/20/81	11:30	5	112.30	27.77						
05/22/81	16:11	5	123.57	18.57						
05/28/81	11:02	5	231.60	25.64						
05/29/81	14:12	5	254.37	27.14						
06/04/81	15:10	5	451.77	48.60						
06/09/81	10:41	5	465.70	47.14						
06/12/81	15:25	5	584.14	58.30						
06/16/81	16:02	5	719.72	72.92						
06/18/81	15:40	5	732.20	57.64						
06/19/81	11:23	5	751.70	83.30						
06/25/81	15:10	5	913.70	122.54						
07/10/81	99:99	1	219.47	52.00	3	380.80	53.40	8	513.77	104.77
07/13/81	11:00	1	263.92	62.25	3	581.99	95.29	8	710.75	131.72
07/16/81	11:00	1	246.89	62.99	3	567.49	112.82	8	463.85	96.22
07/17/81	10:50	1	211.22	53.69	3	650.02	121.97	8	429.39	91.02
07/21/81	11:25	1	231.02	59.99	3	544.89	89.39	8	574.59	115.42
07/22/81	12:08	1	280.19	71.09	3	650.17	149.62	8	575.69	103.19
07/23/81	15:20	1	219.12	53.15	3	564.92	151.95	8	522.22	121.89
07/28/81	11:30	1	193.92	43.72	3	564.92	175.67	8	470.95	92.65
07/29/81	15:45	1	238.89	62.22	3	619.25	217.65	8	546.62	110.92
07/30/81	15:05	1	228.15	51.95	3	450.89	124.35	8	460.85	94.49
08/04/81	11:02	1	211.12	58.62	3	494.79	147.45	8	539.99	98.99
08/07/81	16:01	1	191.52	60.49	3	561.62	258.32	8	489.52	96.45
08/10/81	15:37	1	190.62	54.79	3	480.87	235.27	8	501.69	93.35
08/11/81	13:47	1	176.65	52.85	3	523.89	271.12	8	455.39	92.39
08/14/81	13:40	1	222.35	65.65	3	583.85	355.22	8	531.42	114.49
08/24/81	16:05	1	103.27	61.07	3	485.57	333.72	8	435.27	112.82
08/30/81	12:40	1	135.12	89.92	3	453.22	330.87	8	561.07	132.47
09/02/81	15:39	1	60.22	52.37	3	410.47	296.12	8	477.02	111.97
09/04/81	15:38	1	57.07	53.17	3	0.	0.	8	431.42	99.52
09/06/81	14:30	1	62.17	54.22	3	357.72	277.62	8	410.27	62.77
09/09/81	15:17	1	42.22	41.72	3	0.	0.	8	388.87	129.67
09/13/81	14:25	1	60.92	59.17	3	0.	0.	8	348.32	106 47
09/15/81	15:50	1	48 22	47.92	3	0.	0.	8	352.42	113.92
09/16/81	15:30	1	38.92	38.72	3	0.	0.	8	309.47	108.87

Soybean Field # 1

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)
06/18/81	14:10	5	136.32	15.72
06/24/81	09:32	5	102.72	18.35
06/25/81	13:30	5	91.95	16.49
07/02/81	10:00	5	98.22	16.25
07/13/81	09:42	5	127.75	21.15
07/15/81	13:20	5	228.45	44.72
07/16/81	13:35	5	270.59	49.79
07/20/81	14:10	5	227.69	45.29
07/22/81	10:15	5	271.02	45.02
07/23/81	09:50	5	452.95	67.92
07/28/81	14:59	5	394.09	70.62
07/29/81	09:50	5	554.42	96.65
07/30/81	10:00	5	418.47	71.12
08/03/81	14:22	5	426.12	71.75
08/06/81	11:20	5	607.69	114.22
08/10/81	15:20	5	242.02	44.02
08/12/81	11:17	5	212.35	41.15
08/13/81	1 :25	5	310.15	54.22
08/24/81	15:32	5	314.67	73.72
08/28/81	14:25	5	190.52	48.32
08/30/81	13:35	5	282.57	60.92
09/01/81	14:08	5	403.42	89.82
09/03/81	14:38	5	344.12	81.42
09/08/81	14:50	5	335.67	92.12
09/10/81	15:40	5	276.13	65.33
09/13/81	12:45	5	526.43	139.88
09/15/81	14:14	5	513.48	138.93
09/16/81	14:20	5	287.60	65.56
09/21/81	15:35	5	271.58	80.83
09/23/81	15:11	5	187.33	45.33
09/28/81	15:28	5	203.73	64.48
09/30/81	15:04	5	153.13	75.98
10/02/81	14:13	5	141.83	70.53
10/05/81	14:13	5	164.83	97.48
10/07/81	13:48	5	90.68	55.98
10/14/81	15:00	5	90.33	73.93
10/19/81	14:36	5	88.53	81.03

Soybean Field # 2

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)
06/18/81	15:20	5	139.32	22.92
06/24/81	11:05	5	85.79	17.85
06/25/81	15:05	5	109.85	21.92
07/02/81	12:10	5	163.39	30.75
07/13/81	09:45	5	192.15	33.95
07/15/81	14:43	5	194.72	39.82
07/16/81	14:34	5	189.79	41.89
07/20/81	15:55	5	258.55	49.59
07/22/81	11:40	5	246.05	50.45
07/23/81	11:10	5	292.59	53.39
07/28/81	16:15	5	249.52	48.82
07/29/81	11:05	5	528.75	101.25
07/30/81	11:30	5	416.85	102.85
08/03/81	15:19	5	663.19	126.79
08/05/81	14:38	5	438.42	82.42
08/07/81	10:45	5	78.72	15.52
08/11/81	11:18	5	221.19	46.35
08/13/81	11:50	5	270.05	52.52
08/24/81	15:08	5	238.17	59.07
08/28/81	16:39	5	431.47	107.77
08/30/81	14:10	5	416.62	107.22
09/01/81	15:31	5	308.27	79.77
09/03/81	16:00	5	264.87	72.37
09/06/81	16:00	5	353.02	104.47
09/13/81	13:09	5	319.68	72.83
09/15/81	14:25	5	218.43	83.68
09/17/81	14:51	5	100.63	42.43
09/21/81	16:02	5	67.98	48.53
09/23/81	15:43	5	58.28	42.08
09/28/81	15:57	5	58.93	51.83
10/02/81	14:45	5	69.13	65.28
10/05/81	14:45	5	60.08	56.28
10/07/81	14:17	5	63.88	59.03
10/14/81	15:30	5	71.53	55.63
10/19/81	15:00	5	60.23	56.08
10/21/81	14:30	5	70.63	66.08
10/23/81	15:31	5	49.63	40.98

Soybean Field # 3

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)
06/18/81	15:23	5	315.12	41.92
06/24/81	11:32	5	222.35	35.65
06/25/81	14:52	5	193.45	33.29
07/02/81	15:30	5	217.09	38.49
07/13/81	09:59	5	229.05	43.49
07/15/81	14:30	5	224.72	51.02
07/17/81	09:58	5	297.79	50.39
07/21/81	09:45	5	373.19	61.69
07/22/81	11:37	5	356.62	62.29
07/23/81	11:35	5	411.55	76.02
07/28/81	16:45	5	511.05	102.82
07/29/81	11:30	5	388.75	81.59
07/30/81	11:43	5	450.22	92.25
08/03/81	15:38	5	320.52	67.35
08/06/81	11:40	5	830.42	154.05
08/07/81	10:03	5	309.22	63.95
08/10/81	16:29	5	254.22	56.79
08/11/81	11:10	5	249.37	56.87
08/13/81	12:05	5	445.09	98.89
08/24/81	15:15	5	434.77	118.37
08/28/81	14:02	5	384.27	111.02
08/30/81	14:35	5	411.17	111.02
09/01/81	15:39	5	220.52	52.52
09/03/81	16:08	5	510.07	148.27
09/08/81	16:10	5	248.62	78.37
09/10/81	15:49	5	333.28	67.18
09/13/81	12:55	5	183.08	70.58
09/16/81	15:49	5	136.08	73.93
09/18/81	15:45	5	280.58	51.23
09/21/81	16:10	5	68.38	53.83
09/23/81	15:52	5	70.43	63.13
09/28/81	16:04	5	110.93	106.83
10/02/81	14:54	5	177.63	105.98
10/05/81	14:53	5	81.88	73.88
10/07/81	14:27	5	63.03	59.18

Soybean Field # 4

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)
06/19/81	14:35	5	53.02	11.22
06/24/81	15:47	5	26.62	6.39
06/25/81	10:58	5	31.[illegible]9	7.19
07/02/81	14:55	5	45.42	14.09
07/13/81	10:12	5	60.85	11.75
07/15/81	10:05	5	75.95	19.59
07/16/81	10:27	5	89.09	22.65
07/21/81	11:05	5	193.59	41.39
07/22/81	15:15	5	123.22	25.49
07/24/81	10:45	5	144.85	26.42
07/27/81	15:30	5	178.35	38.79
07/28/81	10:50	5	167.29	32.95
07/29/81	14:45	5	270.15	51.49
07/31/81	10:35	5	263.12	47.49
08/03/81	16:07	5	290.35	53.29
08/06/81	10:30	5	453.39	79.45
08/07/81	15:23	5	125.49	23.22
08/10/81	14:50	5	159.49	29.82
08/11/81	15:40	5	199.99	42.42
08/14/81	99:99	5	189.19	38.99
08/26/81	14:58	5	303.42	66.97
08/30/81	11:45	5	180.72	43.47
09/01/81	14:51	5	257.87	67.07
09/06/81	13:00	5	198.07	56.27
09/10/81	14:20	5	128.83	20.68
09/13/81	13:40	5	193.33	56.53
09/16/81	14:35	5	158.18	45.68
09/17/81	15:30	5	201.43	55.93
09/21/81	14:20	5	164.73	59.43
09/23/81	14:10	5	137.18	54.83
09/28/81	14:22	5	66.63	48.43
09/30/81	14:17	5	58.53	54.58
10/02/81	15:30	5	55.03	48.53
10/05/81	15:40	5	53.93	51.53

Soybeau Field # 5

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)
06/18/81	99:99	5	131.32	19.32
06/25/81	11:10	5	93.89	18.75
07/02/81	15:25	5	61.29	13.89
07/13/81	10:20	5	74.25	16.72
07/15/81	10:47	5	50.67	15.27
07/16/81	10:53	5	67.35	19.22
07/22/81	15:56	5	70.89	16.39
07/23/81	15:05	5	125.32	28.09
07/24/81	11:45	5	158.45	32.19
07/27/81	16:14	5	175.19	36.79
07/28/81	11:08	5	122.52	26.65
07/30/81	14:45	5	154.75	33.25
07/31/81	10:55	5	192.42	39.72
08/03/81	16:25	5	175.02	36.99
08/05/81	15:44	5	332.82	68.02
08/07/81	15:46	5	64.19	12.59
08/12/81	10:45	5	153.12	33.42
08/14/81	10:25	5	130.19	32.32
08/26/81	14:28	5	103.82	26.77
08/30/81	11:45	5	131.77	34.97
09/02/81	14:20	5	172.87	50.17
09/06/81	13:54	5	118.42	32.57
09/09/81	15:46	5	133.93	24.43
09/13/81	14:06	5	174.93	26.33
09/16/81	15:10	5	97.58	47.23
09/17/81	16:00	5	107.73	60.43
09/21/81	14:50	5	91.13	65.03
09/23/81	14:42	5	59.18	43.18
09/28/81	1' 55	5	23.43	19.43
09/30/81	14:45	5	25.83	24.53

Soybean Field # 6

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)
07/20/81	15:00	5	45.82	11.52
07/22/81	10:45	5	47.62	8.55
07/28/81	15:00	5	49.72	8.19
07/29/81	10:15	5	77.55	14.39
07/30/81	10:20	5	59.02	9.62
08/03/81	14:45	5	83.07	15.67
08/05/81	13:39	5	123.39	20.39
08/07/81	11:10	5	105.22	19.29
08/11/81	10:18	5	197.82	36.89
08/13/81	10:48	5	144.25	27.62
08/24/81	14:27	5	123.17	30.82
08/28/81	15:05	5	220.57	49.72
08/30/81	13:54	5	122.27	32.82
09/01/81	14:38	5	136.97	26.12
09/03/81	15:15	5	131.27	30.92
09/08/81	16:05	5	137.97	38.57
09/13/81	12:40	5	169.73	43.03
09/15/81	14:35	5	162.18	47.28
09/17/81	14:32	5	168.33	34.83
09/18/81	15:10	5	133.13	27.53
09/21/81	15:45	5	119.53	35.68
09/23/81	15:25	5	89.93	26.73
09/28/81	15:40	5	56.03	20.73
10/02/81	14:27	5	56.53	31.58
10/05/81	14:26	5	37.23	22.08
10/07/81	14:00	5	54.03	31.83
10/14/81	15:12	5	37.63	29.53
10/19/81	14:40	5	32.98	30.38

Soybean Field # 7

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)
07/29/81	15:21	5	70.77	13.17
08/04/81	15:58	5	68.72	11.89
08/06/81	11:12	5	93.45	14.15

Soybean Field # 8

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)
08/04/81	15:19	5	83.82	15.65
08/11/81	15:30	5	125.95	25.55
08/12/81	10:15	5	221.39	39.99
08/14/81	10:00	5	146.22	28.52
08/30/81	12:05	5	182.72	38.42
09/06/81	13:39	5	296.12	59.27
09/10/81	14:30	5	144.28	25.38
09/13/81	13:35	5	317.08	65.68
09/16/81	14:46	5	171.93	30.83
09/17/81	15:40	5	490.18	65.18
09/21/81	14:30	5	515.43	93.33
09/23/81	14:20	5	369.63	91.43
09/28/81	14:30	5	178.63	42.93
09/30/81	14:25	5	344.43	90.33
10/02/81	15:37	5	270.68	63.28
10/05/81	15:50	5	178.53	44.78
10/07/81	15:08	5	286.33	45.08
10/21/81	15:02	5	131.23	82.38
10/23/81	14:58	5	151.08	94.33
10/28/81	14:02	5	106.28	85.63

Soybean Field # 9

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)
07/24/81	10:20	5	45.05	8.82
07/29/81	15:00	5	77.85	17.32
08/03/81	16:00	5	103.35	20.05
08/06/81	10:30	5	166.09	27.92
08/07/81	14:43	5	167.29	32.82
08/11/81	14:55	5	169.17	34.27
08/12/81	10:20	5	192.99	38.89
08/14/81	09:30	5	148.19	30.99
08/26/81	15:08	5	73.82	17.72
08/30/81	11:35	5	232.77	53.57
09/02/81	14:45	5	113.82	27.62
09/08/81	13:00	5	104.17	27.92
09/10/81	14:12	5	126.28	25.03
09/13/81	13:30	5	109.98	24.18
09/16/81	14:28	5	96.93	28.93
09/17/81	15:23	5	126.88	31.03
09/21/81	14:10	5	134.88	32.38
09/23/81	14:02	5	56.23	15.83
09/28/81	14:14	5	117.58	38.63
09/30/81	14:10	5	87.68	33.63
10/02/81	15:20	5	84.58	36.88
10/05/81	15:34	5	43.43	27.43
10/14/81	14:08	5	35.33	25.68
10/19/81	15:14	5	25.98	24.48
10/21/81	14:53	5	36.28	33.43

Soybean Field # 10

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)
07/30/81	14:43	5	68.72	11.62
07/31/81	10:50	5	38.22	7.55
08/04/81	15:50	5	37.62	7.67
08/06/81	11:05	5	55.22	10.85
08/07/81	14:35	5	63.85	12.72
08/14/81	10:50	5	76.45	15.39
08/26/81	15:15	5	42.57	10.17
08/30/81	12:10	5	43.12	11.22
09/02/81	15:07	5	55.27	12.57
09/06/81	13:42	5	48.52	12.82
09/10/81	14:40	5	86.38	19.33
09/13/81	13:54	5	161.13	37.53
09/16/81	15:00	5	110.83	25.63
09/17/81	15:50	5	69.48	17.38
09/21/81	14:40	5	74.63	18.13
09/23/81	14:30	5	111.53	24.78
09/28/81	14:45	5	86.83	25.53
09/30/81	14:36	5	58.53	18.98
10/02/81	15:46	5	110.43	32.43
10/05/81	15:58	5	83.23	25.78
10/07/81	15:21	5	121.48	26.48
10/14/81	14:27	5	52.83	17.23
10/19/81	15:23	5	55.18	28.58
10/21/81	15:12	5	31.93	20.43
10/23/81	15:13	5	32.33	26.33
10/28/81	14:20	5	24.23	23.78

Soybean Field # 11

Date	Time	Part Code	Wet Wt(g)	Dry Wt(g)
08/03/81	14:57	5	125.09	20.75
08/05/81	13:32	5	165.75	25.92
08/07/81	11:18	5	225.75	35.85
08/11/81	09:40	5	191.99	24.12
08/24/81	14:34	5	116.32	26.17
08/28/81	13:17	5	168.67	36.22
08/30/81	14:07	5	53.92	12.02
09/01/81	14:47	5	137.37	30.97
09/03/81	15:22	5	124.47	27.07
09/08/81	16:15	5	288.27	67.77
09/13/81	12:49	5	194.28	42.38
09/15/81	14:40	5	79.88	21.83
09/17/81	14:39	5	97.93	27.43
09/18/81	15:25	5	78.58	58.43
09/21/81	15:52	5	117.88	40.73
09/23/81	15:32	5	103.53	32.43
09/28/81	15:48	5	43.13	20.88
10/02/81	14:34	5	50.08	28.43
10/05/81	14:32	5	38.03	26.33
10/07/81	14:06	5	51.83	34.58
10/14/81	15:20	5	39.08	29.63
10/19/81	14:47	5	32.28	27.83

REFERENCES

Gabel, Paul F., Jr., Fawwaz T. Ulaby, and David R. Brunfeldt, "MARS X-Band Scatterometer," RSL Technical Report 360-14, Remote Sensing Laboratory, University of Kansas Center for Research, Lawrence, Kansas 66045, November 1981.

National Aeronautics and Space Administration, "AgRISTARS Enumerator's Manual," 1981 Ground Data Survey, Lyndon B. Johnson Space Center, Houston, Texas 77058